

# THE SEAMANS KALENDER,

~~OR 1805. c 77.~~

An Ephemerides of the Sunne, Moon,  
and certaine of the moſte notable  
fixed Starres.

The third Edition :

Newly corrected and enlarged, with an a bridged Table of  
ſignes, and ſome propoſitions thereupon, concerning  
Arithmeticall Nauigation.



LONDON

Printed by Ed. Allde, for Iohn Tappe, and are to be ſolde at his  
ſhop on Tower-Hill, nere the Bul-warke Gate. 1608.

# THE SEAMANS KALENDER.

OR ~~8805. c. 77.~~

An Ephemerides of the Sunne, Moon,  
and certaine of the moſte notable  
fixed Starres.

The third Edition :

Newly corrected and enlarged, with an a bridged Table of  
ſignes, and ſome propoſitions thereupon, concerning  
Arithmetical Navigation.



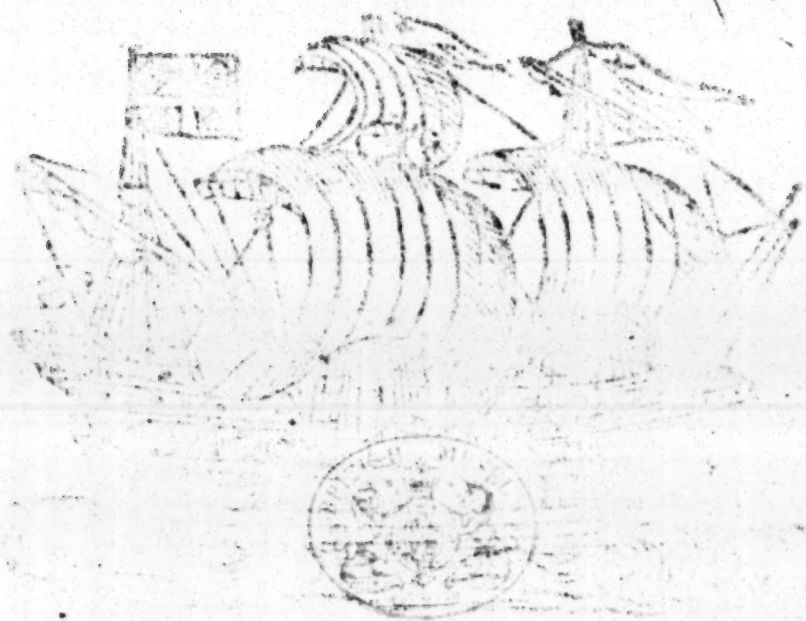
LONDON

Printed by Ed. Alde, for Iohn Tappe, and are to be ſolde at his  
ſhop on Tower-Hill, nere the Bul-warke Gate. 1608.



# THE MAY ALEXANDER

OF  
THE  
FEDERAL GOVERNMENT  
OF THE UNITED STATES  
OF AMERICA  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LANDS  
WASHINGTON, D. C.



1874



To the Right Worshipfull Sir John Paiton Knight, Gouvernor of his Majesties Ile of Iersey, and Gent. of his Highnes most Honorable Priuy Chamber, I. T. wisheth worlds pleasures, and heavens happinesse.



He *Bee* (Right Worshipfull) by serious Industry gathering a certaine hidden vertue from sundry sortes of flowers and hearbs; and making thereof (by labour and trauaile) a materiall Lumpe, namelye the Hony combe: is not therefore to be condemned by any, but rather highly commended of al. The Phisition, of many simples making one compound medicine, doth not onely thereby reap profit to himselfe, but applauditie of others: And the studious Reader, out of many Authors doth select some cheefe principles, which hee recordeth as memorials, eyther to profit himselfe or to pleasure others.

Of these three comparisons, the first is excellent for immitation in general; the second verie necessary for diuers in peiticular, and the last, (though not so highly esteemed of the common sort of people) by reason of their ignorance in Artes & Sciences, yet for the good that may come thereby to a common-wealth, nothing inferiour to the best: especially, where their study tendeth to good & vertuous exercises, or the practise and contemplation thereof to laudable Artes & Sciences. Of which Artes, namely *Mathematical*: Nauigation being a principal member, as hauing participation in *Arithmetike*, *Geometrie*, *Geography*, *Cosmographie* and *Astronomy*, or rather to say the truth, beeing the quintessence of them all, yea the prooffe and tryall of them: for albeit that men reade or heate neuer so much of *Cosmographie* or *Astronomie*. yet without practise & experience it is vnperfect: & how can perfection be attained but by sayling and transporting from place to place, thereby beholding the aduersities of dayes and nights, with the temperature of the ayre in sundry Regions, wherby the whole course and reuolution of the Spheare is made

## The Epistle Dedicatorie.

apparant to mans capacitie? & by what meanes can Sayling be performed but by Nauigation? Which so being, it may be affirmed that as the *Mathematical* Sciences are the grounds of Nauigation, so is Nauigation the onely meanes, whereby the excellency of those Artes & Sciences, are prooued & layde open to the view of the world. Therefore very aptly may Artes be tearmed the Mirrour of nature, becaufethat by Artes, the wonderfull & hidden secrets of nature are reuealed: And Nauigation may bee called the tryall of Artes, being that thereby the whole studie of Artes is prooued to be true. These reasons moouing mee, as also being many times conuerfant with Seamen & Mariners, wherby I perceiued what they (I meane the common and plainer sort of them) chiefly desired: at my best leysure I made a collection of such Tables & rules, as I thought fittest for their purposes: and being instantly vrged by diuers to publish them, although I was very loath to aduenture my simple labours to the common view of carping censures: yet at last (hoping well of the best, and not greatly respecting the worst) I resolved to hazard my papers to the presse, and my selfe to the censure of seuerall opinions: when bethinking with my selfe (as the common custome of the world is) vpon a Patron to protect it from the malicious slaunders of malignant spirits, I presumed vpon your Worships fauour in two respects: the one in consideration that your selfe, being so well acquainted in the Artes *Mathematicall*, would (though not in respect of the Author, yet for affection to the matter) vouchsafe the protection of them. The other, that being in duetic bound to be at your Worships pleasure, I knowe not how I might shew my selfe duetifully affected, better then by dedicating my (though vnpolisht, yet well willing) labours to your fauorable disposing; beseeching your Worship to accept of them, and to pardon my boldenes: and so with my dayly prayers to God for your health and prosperous successe in all your actions, I rest

*Your Worships, moste dutyfully to be  
commanded Iohn Tappe.*



## To the Courteous Readers health.



Entle and indifferent Readers, whose iudgements are not so sophistically mixed with humorous conceites, and quipping quidities, (as many are now a daies) who are apter with their turbulent tongues to condemne all things, then with sensible iudgements to amend any thing: as for them or any such carping Zoylistes, I am indifferently perswaded to set as lightly by their partiall & iudiciall censures, as they are farre from hauing a good opinion of ought but what is agreeable to their owne fantastickall fixions: Onely to them that are of more plausible spirits and grauer iudgements, who (for the moste parte in reading) applaude that which is good, and passe ouer which silence that which is not hurtfull, without scoffing at the worke, or deriding the Author: and to those that hauing small vnderstanding, are desirous of more knowledge in the art of Nauigation, and other Mathematicall studdies; To the one I commit the censuring of my worke, and to the other the profit of my labors: knowing that the wise will rather winke at small faulkes, then rashlye reprocue that which may profit others, though not pleasure themselves: and though (as I say) the curious & expert Mariners finde nothing heerein contained which may satisfie their expectation, yet I hope they will iudge fauourably of my intencion, & with patience passe it ouer for affections sake to the Arte it selfe, with charitablye that



## To the Reader

my skill were answerable to my will: as for the meaner sort, whose experience haue not beene taxed with Artes rudiments, nor their iudgements fined with demonstratiue illustration in the Mathematicall Sciences, but onely are now (as it were) setting themselues with willing mindes to learne what they before wanted, I make no question, but as by these following Tables and Propositions they reape profit: so accordingly, in yeelding friendlye censures vpon mee and my works, they shal answere my expectations with a ful recompence of my passed labours. And so I leaue thee friendly Reader, to the practise of what followeth, hoping that as it may be profitable to all, so it can no way be hurtfull to any.

*Yours to vse. I.T.*





# Certaine difinitions , meete to be vnderstood of those that will practise Navigation.



Spheare or Globe, is a round figure, made by the turning of halfe a Circle, till it end where it beganne to bee mooued , or a massie body inclosed with one platforme or surface : in the middle whereof is a picke , from which all lines drawne to the surface, are equall.

Center is the point or picke aforesaide, in the middle of a Spheare, Globe, or other Circle.

Diameter is a right line, drawne through the Center , to the Circumference or surface of a Spheare or Circle to each side thereof.

Circumference, is a round Circle, equally distant on all sides, from the Center thereof.

Surface or Superficies, is the vpper part of any thing.

A Degree is the  $\frac{1}{360}$  part of the circumference of any circle.

A Minute is the  $\frac{1}{60}$  part of a Degree, being vnderstood of measure : but in time, a minute is the  $\frac{1}{60}$  part of an houre, or the fourth part of a degree. 15. degrees answering to an houre, and foure minutes to a degree.

The Pole is a point or picke imagined in the heauens, whereof are two, the North Pole and the South Pole, opposite one to another: the North Pole being the center to a circle, described by the motion of the North Starre , or the taile of the

## The Sea-mans Kalender.

little beare : From which point aforesaid , a lync imagined to passe through the Center of the earth , & passing directly to the opposite part of the heauens, betweth the South pole.

The Equinoctiall, is a great circle imagined in the heauens: also deuiding the heauens into two equall partes , and lying iust in the middle betweene the two Poles , being in Compasse from West to East , 360. degrees , euerie degr , of terrestriall measure, valewing 20. english leagues or 60. miles.

The Meridian is a great Circle deuiding the Equinoctiall at right angles into two equall partes , passing also through both the Poles & the Zenith : to which Circle , the Sunne comming twice euer 24. houres, maketh the middle of the day and the middle of the night.

Note that euery place hath a seuerall Meridian, which doe all meete together in the Poles of the world.

Zenith , is a point or picke in the heauens , right ouer our heads, 90. degrees from the Horizon, as the Pole is 90. degrees from the Equinoctiall.

Nadir, is a point or Picke in the heauens vnder our feete, opposite to the Zenith.

Horizont, is a great Circle, diuiding that part of the heauens which wee see, from the other part wee see not.

Azimuth, is a great Circle, crossing the Horizont at right angles as the Meridians doe the Equinoctiall, beeing many as the Meridians are : and as the Meridians concurre and meete together in the Poles of the world, so doe the Azimuthes meete in the Zenith, which is the Pole of the Horizon.

Paralels, are lines or Circles equally distant in all partes one from another, as all Circles of East and West are paralell to the Equinoctiall.

Almicanterahs, are Circles paralell to the Horizon, beeing also Circles of Latitude or elcuation, being that the altitud of the Sunne, Moone, or Starres aboue the Horizon are described thereby : which Almicantars doe crosse the Azimuthes, as the Paralels or Circles of East and West doe crosse the Meridians.

The



## The Sea-mans Kalender.

The Tropickes are two lesser Circles paralell to the Equinoctiall, limmiting the boundes of the Zodiacke or the greatest declination of the Sunne on each side of the Equinoctiall. The Tropicke of Cancer northward, and the tropicke of Capri. southward whose distance from the said Equinoctiall are 23. degrees. 28. mi.

The Zodiacke, is a great Circle, crossing the Equinoctiall in two opposite places thereof, and swaruing Byas wise there from, towards either of the Poles, touching the tropick of Can. on the north part, and the Tropick of Cap. on the south part ther of. In the Zodiack are the 12. signes, viz. Aries, Taurus, Gem. Canc. Leo, Vir. Libra, Scorp. Sagi. Cap. Aquarius Pisces, euerie signe being 30. deg. in length, & 12. in bredth: thzough which signes the Sun passing, describeth a yeare, and the Moone passing likewise through the same, makes a month: the 12. degrees that the Zodiacke hath in bredth, is allowed for the Latitude of the Planets.

Eclipticke, is a circle lying iust in the middle of the Zodiack, out of which the Sunne neuer goeth, but the Moone & the other Planets are sometime on the one side, and sometime on the other side thereof, in which the head and taile of the Dragon also is.

The head and taile of the Dragon, are two opposite pointes in the Ecliptick line of the Zodiack, which goeth backward through all the 12. signes in 19. yeares: and when it hapneth that the Sun and Moone are in coniunction, in that place of the Ecliptick, where the head or taile of the Dragon is, then is the Sunne Eclipsed, and being in the opposition, the moon being in either of the said points, the Moone shall be eclipsed.

The Circle Articke, is a circle which incloseth all those Stars which doe neuer rise nor set in any Latitude, but are alwaies aboue the Horizon, where the North Pole is raised, the like is vnderstoode of the Circle Antarticke, where the South Pole is raised.

The Polar circles, are two little Circles distant from the poles of the world, so much as is the greatest declination of the Zodiacke from the Equinoctiall: in which Polar circles are the Poles of the Zodiacke.

Colures, are two great Circles passing through both the poles,  
A 5 crossing



## The Sea-mans Kalender.

crossing one another in the said Poles at right angles, and deu-  
ding the Equinotiall and the Zodiacke into foure equall partes,  
making thereby the foure seasons of the yeare: the one Colure  
passing through the Equinotiall pointes of Aries & Libra, shew-  
eth the beginning of the Spring time & Autumne: at which two  
times the daies and nights are equall. The other Colure passing  
through the two tropicall points of Cancer & Capricorne, shew-  
eth the beginning of the summer & winter: at which two times,  
the daies and nights are longest and shortest.

Altitude in the heauens, is the height of any thing aboue the  
Horizon towards the Zenith.

Latitude is the widenes or distance of the planets or stars, from  
the Eclipticke, eyther northward or southward. Also Latitude is  
the distance of the Zenith of any place from the equinotiall, to-  
wards eyther of the Poles, which is alwaies equall with the  
height of the Pole of the same place.

Longitude is length, and in the heauens it is vnderstood the di-  
stance of any Star or Planet, from the biginning of Aries to the  
place of y<sup>e</sup> said Planet or Star, or from the beginning of any signe  
to a certaine other parte or degree of the same signe: Other wise,  
longitude in the earth, is the distance of the meridian of any place,  
from the Meridian which passeth ouer the Isles Azores: where  
the beginning of longitude is said to be: longitude, is counted by-  
pon the equinotiall, and latitude vpon the Meridian.

Declination is the declining or distance of the Sun, Moone or  
Starres, from the equinotiall: and is said to be North or South,  
according to that Pole towards which it leaneth.

Amplitude is the distance of the rising and setting of the Sun,  
Moone, or Stars, from the true east or west point of the Compass  
vpon the Horizon.

Ascension, is the rising of any Starre, or of any portion of the  
Eclipticke aboue the Horizon.

The Golden number or Prime, is the time of 19. yeares: in  
which time the Sunne and Moone maketh all varietie of their  
coniunctions, Oppositions, and other Aspects.

Epact, is the 11. daies and three houres, which are added to  
the

## The Sea-mans Kalender.

the yeare of the Moone being 354 daies, to make it equall with the yeare of the Sunne, which consisteth of 365 daies, and  $\frac{1}{4}$ . By the Prime is found out the Epact: and by the Epact is found out the age of the Moone.

The Circle of the Sunne, is the number of 28. because that in 28 yeares, all the variety of Dominicall or Sunday letters and leape yeares are expyed, being that the 29. yere, the said Circle both begin againe: the vse of the which number is to finde out the Dominicall Letter for any yeare past, present or to come. Where note, that there is but 7. letters which serue for Sunday letters, viz. A B C D E F G, And albeit that in the dayes of the week, they proceed according to their naturall order of the Alphabet, yet in the yeares they goe backward: as if G. be for one yeare, F shall be for the next: & when it is leape yeare (which is euery fourth yeare) then is there two Letters for y<sup>e</sup> yere, the first seruing from the first of January til S. Mathias day, which is then the 25. of Februarie, & then the other letter takes place, and serues till the end of the yeare.

To finde which number of the Sunnes circle, and consequently the Dominicall letter for the yeare proposed; to the yeare of our Lords, adde 9. that totall deuide by 28. and that which remaines is the Circle of the Sunne for that yeare: Then to know the Dominicall Letter, note that the 28. yeare the Dominical letter is A. and is the third from the leape yeare: therefore the first to begin withall againe, is G F. because it is another leape yeare, and so counting the 7. letters backward, and euery fourth yere counting two letters, that letter vpon which the number of the Suns circle endes, shall be the Sunday letter for the yeare proposed.

As for example: the yere 1605. adding 9. thereto, it makes 1614 that being deuided by 28. the remainer is 18. the circle of the sun: then counting y<sup>e</sup> 7. letters backward til I haue counted 18. places, beginning w<sup>th</sup> GF thus: 1. GF. 2. E. 3. D. 4. C. 5. BA. 6. G. 7. F. 8. E. 9. DC. 10. B. 11. A. 12. G. 13. FE. 14. D. 15. C. 16. B. 17. AG. 18. F. I finde that the 18 place endes vpon F. which I conclude to be the dominicall letter for the yeare aforesaid: and it is the first yeare after the leape yeare.

And here is to be noted, that the Prime and Dominicall letter, changes

## The Sea-mans Kalender.

changes the first day of Januarie, and the Epact the first day of March.

### To finde out the Prime,

Deuide the yeare of our Lord by 19. and to that which remaineth after the deuision, adde one: the product is the prime number for all that yere.

### As for example.

I would know the Prime for the yeare 1605. deuide 1605. by 19. and you shall haue in the quotient 84. and after the diuision, there rests 9. vnto which if you adde one, it makes 10. which is the Prime for the yeare 1605.

### To finde out the Epact.

Adde to the Epact of the yeare past 11. and if it passe 30. take away 30. and the product is the Epact for all that yeare: but otherwise, which is the better way: imagine three places vpon your hand, which for example let it be the 3. ioyntes of one of your fingers, and call or name the first ioynte 10. the second 20. the third 30. then count the Prime number vpon the three ioyntes aforesaid, and going ouer them vntill you come to the end of the said Prime number, marke vpon which your Prime endes, and adding the number of the ioynt with the Prime, if they come not to 30. that shall be the Epact for all that yeare: if they passe 30. take away 30. and the remainder is the Epact.

### As for example.

The yeare 1605. the Prime is 10. & imagining the first ioynt of my finger to be 10. the second 20. the third 30. I count vpon the three ioyntes 10. the Prime number, viz vpon the first ioynt I tell 1. on the second 2. on the third 3. Againe on the first 4. on the second 5. on the third 6. Againe on the first 7. on the second 8. on the third 9. and on the first againe 10. which is the Prime ending vpon the first ioynt which I call 10. therefore adding 10. the number of the first ioynt to the Prime 10. makes 20. which is the Epact also for the yeare 1605.

### To know the Moones age.

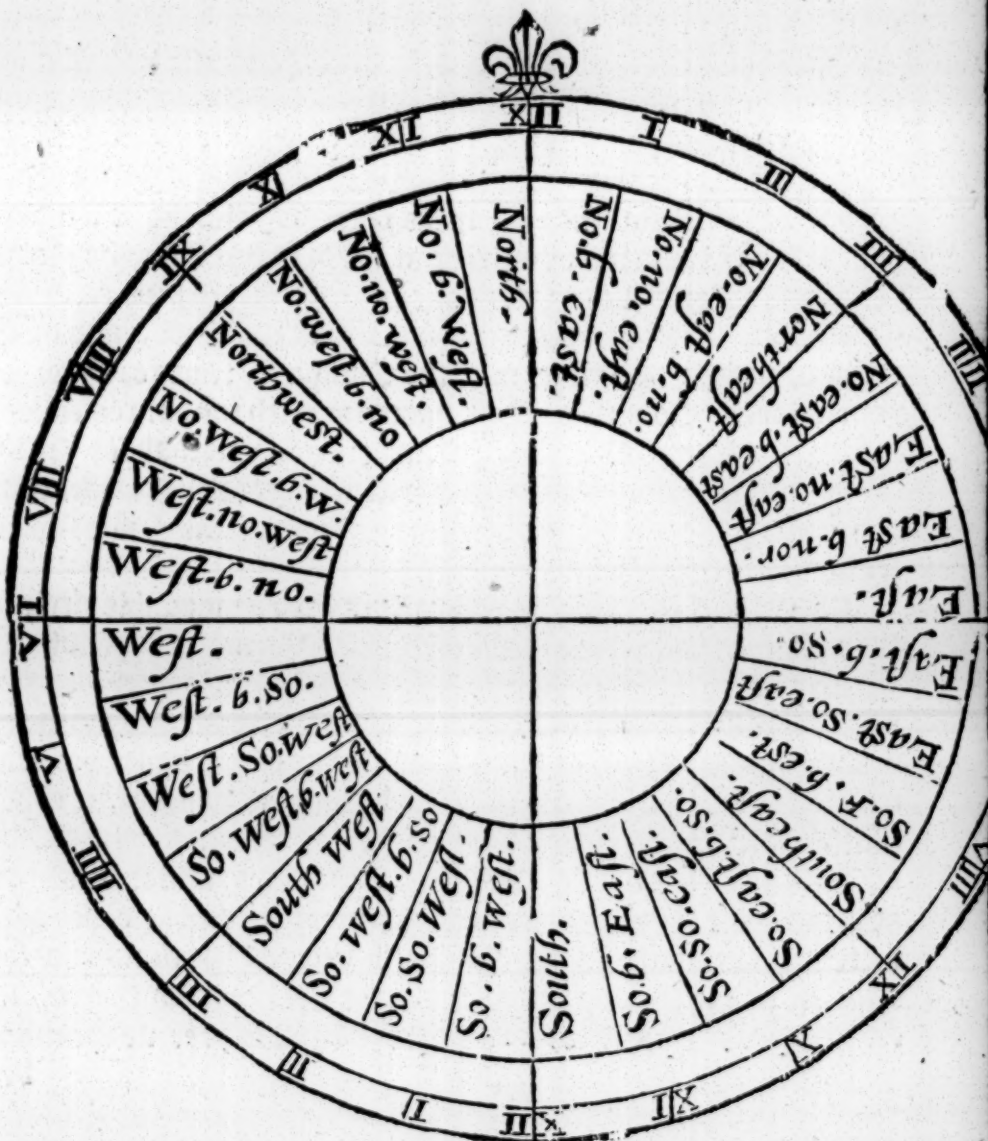
Adde to the day of your Month the Epact, and so many dayes more as are months fro march to the month you are in, including both



# The Sea-mans Kalender.

both monthes, and if they come not to 30. so much is the Moones age: but if they passe 30. take away 30. and the ouerplus is the Moones age.

This is when the month hath 31. daies, but if the month hath but 30. daies, you must take away but 29. and the rest is the age aforesaid: for in those monthes that haue 31. daies, the Coniunction is the 30 day of her age, and in those monthes that haue 30. daies, the Coniunction is the 29. day of her age.





## *A declaration of the former Instrument.*

**T**his instrument giues you a plaine and easie order, for the shifting of the Sunne and Moone, for euery day of her age, and also it is a readie and most necessarie reckoning of the tides, whereby also is showane the common order to bring thereby the 32. points of the Mariners Compasse to 24. houres of the day & night, which are the first rudiments to be learned of the young scholler, or apprentice in Nauigation.

First heere is the common Mariners Compasse with the 32. pointes thereof plainly set downe, the names being printed vpon each seuerall point, which must bee perfectly learned without booke: then is there in the vttermoste edge, a circle deuided into 24. partes which signifie 24. houres of the day and night, where you may see that twelue a clocke at night is iust vpon the North point of the Compasse, 12. at noone vpon the South point of the Compasse: 6. a clocke in the morning, vpon the East, and 6. at night vpon the West point of the Compasse: and for the other pointes of the Compasse their agreeing with the houres, euery point of the Compasse makes  $\frac{1}{4}$  of an houre as you may see North and by east is vpon  $\frac{1}{4}$ . of an houre past 12. North Northeast, 1. houre and  $\frac{1}{4}$ . Northeast and by North 2. houres and  $\frac{1}{4}$ . and so consequently of the rest.

Also to the Center of this compasse is fixed a moouable circle to turne round about the said compasse: the vttermoste edge wherof mouing close within the circle of houres, is deuided into 29. equal parts, signifying the daies of the Moons age, which are numbred in Arithmetical figures, from the first day of her age to her conjunction or meeting againe with the Sunne: at which place of her conjunction, is left a little index or shewer to direct you to the houres and points of the Compasse: which index also shewes you how much the Sunne & Moone are a sunder euery day of her age, by telling the pointes of the Compasse betwixt the number of the Moones age in the said moouable circle and the index thereof, accounting euery point for 11. degrees &  $\frac{1}{4}$  or otherwise the number

## The Sea-mans Kalender.

ber of houres contained in the vttermoske circle, betwixt the said number of the Moones age & the index, accounting euerie houre for 15. degrees, shewes the degrees of distance betwixt the Sun and Moone.

Now to keepe a recconing of the tides thereby, you must know by the table heerafter set for that purpose, how it flowes, that is to say, what Moone makes full Sea or high water at that place where you would know the time of the tide or high water for the day proposed: which knowne, you must also by the former propositions, or else by the Kalender following, know the Moones age: then seeking out the number of the Moones age in the moouable Circle, place the said number of the moones age vpon that point of the Compasse which makes full Sea vpon the change day at your place desired, and staying it there, the index which is in the said moouable Circle, points you directly to the point of the Compasse that the Sunne must be vpon, when it shal be high water the for said day in the desired place, and also in the vttermoske fixed Circle it shewes the houre of the day which you desire.

### An example.

The first of Ianuarie 1605. I desire all this aforesaid: First for the Moones age, because that the Epact changes not til the first of March, I adde the Epact of the last yeare, which is 9. and the day of the month 1. is 10. then Ianuary being the eleuenth month from March, a 11. added thereto makes 21. for the Moones age the first of Ianuary. 1605.

Againe, to know how much the Sunne and Moone are aunder, the Moone being 7. daies olde, I seeke the mooueable Circle for the Moones age, which being 7. I place 7. vppon any certaine point of the Compasse, which for example is heere west, and the index shewes the North and by west, and  $\frac{5}{4}$  to the Northward, which is 7. pointes and  $\frac{3}{4}$  and multiplied by a 11.  $\frac{1}{4}$  make 87. deg. for the distance betwixt the Sunne and Moone, and in houres it shewes 5.  $\frac{3}{4}$  which multiplied by 15. yeelds the like, being verie neere  $\frac{3}{4}$  of the Zodiack.

Then for the tides, at London Bridge it flowes Southwest  
and

## The Sea-mans Kalender.

and north east, 02 is high water at 3 a clock on  $\frac{1}{2}$  change day: therefore when the moon is 7 daies old, I place 7. the moons age, vpon the point south u est 3 a clock, & staying the moone a ble riddle there, I see that the index shewes almost north west, which is 35. mi. or nere  $\frac{1}{2}$  quarters of an houre past 8. of the clock, at which time it shal be high water at London bridge, the Moone being 7. daies olde.

Againe, at Harwiche where it flowes South and by east, the Moone ten daies old, I lay ten (the Moones age) vpon the point of the compasse South and by east, and then the index shewes the point west north west of the compasse, and the circle of houres 1. houre past 7. which is the time of the full Sea at Harwiche, the Moone being ten daies olde.

But if you want a Table or instrument to worke the account of the tides, you may doe it by memorie, multiplying the Moones age by 4. and deuide the product by 5. and to the quotient adde for euerie vnitie which remaines vpon your diuision 12. mi. that total adde to the houre that it makes full sea on, vppon the change day, the product shall be your desired number, as in the first example.

The Moone 7. daies old, and the high water at London on the change day, at 3. of the clocke, I multiply 7. (the Moones age) by 4. makes 28. that deuided by 5. the quotient is 5. and 3. remaines vpon the diuision, which 3. being so many times 12. minu. makes 36. minu. and added to 5. in the quotient, makes 5. houres 36. min. that added to 3 the houre of full sea vpon the change day, makes 8 of the clocke and 36. minutes as aforesaid.

## The gouernment of the Planets.

**D**iuers writers haue disagreed, concerning the planitarie houres. some making the houres of the Planets, equall with the houres of the clockes, & so continuing their Regiment orderly with the other common houres. Some againe, beginning the saide Planitarie houres at noone, some at midnight, and some againe at the Sunne rising: which indeede for the time of the beginning of the account is the best, & for the difference of the equalitie & inequality betweene the Planitary houres, and the common houres of the clockes, Gemma Frisius agreeing with  $\frac{1}{2}$  best Astro-  
nomers,



## The Sea-mans Kalender.

nomers saith, that as the daies and nights do increase or decrease, so must the planetarie houres be longer or shorter accordingly, neuerthelesse so that there shall be 24. planetarie houres in the day and night, as well as of other houres, but that if the day consist of more then 12. houres, the proportionally the planetarie houres to consist of more then 60. minutes: and if the day be lesse then 12. houres, the the planetarie houres, to bee lesse then 60. minutes: & if the day be iust 12. houres, then the planetarie houres are equal to the houres of the clockes and not other wise. The like is to bee vnderstood of the nights: & to make an equalitie of the planetary houres to them of the clockes, being that how long scuer the day is, yet there must be 12. planetarie houres: and how short soeuer the day is, there must be (neuerthelesse) bec 12. planetarye houres, and so of the night, by which you see that the planetarie houres are sometimes greater and sometimes lesser then the common houres of the clockes, which alwaies consist iust of 60. min. therefore if you deuide the day into 12. equall partes, one of those parts shall be the quantitie of a planetarie houre, which you may doe thus: multiply the houres of the day into minutes by 60, & if there be any odde minutes, ad them to the product, the totall being deuided by 12. the quotient shewes the number of minutes contained in an vnequall or planetarie houre.

And againe, if at any houre of the day or night you knowe not what planetarie houre it is, & is to say, how many planets haue ruled since the beginning of the day or night proposed: multiply the number of the houres past from sunne rising by 60. and deuide the product by the number of the minutes contained in an vnequall or planetarie houre, the quotient will shew you how many houres and minutes of the Planets are past from the Sun rising (if it be in the day) or from Sunne setting if it be in the night: which knowne, enter the table following to knowe what Planet rules the day and houre proposed, looking for the houre desired in that Coloume which is right vnder the day proposed: those Planets which are gouernours of the said houres in the day time, being placed on that side next the left hand and the gouernours of the night on the right hand.



# The Sea-mans Kalender.

## Example.

The 17. of May being Sunday at 9. of the clocke in the Morning, I would knowe what Planet rules. First in the following Kalender, I finde that the 17. of May the day is 16. houres long, therefore I multiplie 16. houres by 60. minutes and the product is 960. that devided by 12. brings in the quotient 80. mi. for the length of a Planetarie houre at that time: then from 4. of the clocke (the time of the Sunnes rising)

Gouernour of the day.	Sunday,	Munday,	Tuesday,	Wednesday,	Thursday,	Friday,	Saterday,	Gouernour of the night.
Sol	1	12	9	0	10	0	11	Iupi.
Venus	2	0	10	0	11	1	12	Mar.
Mercurie	3	0	11	1	12	2	0	Sol.
Luna.	4	1	12	2	0	3	0	Ven.
Saturne	5	2	0	3	0	4	1	Mer.
Iupiter	6	3	0	4	1	5	2	Lun.
Mars	7	4	1	5	2	6	3	Satu.
Sol	8	5	2	6	3	7	4	Iupi.
Venus	9	6	3	7	4	8	5	Mar.
Mercurie	10	7	4	8	5	9	6	Sol.
Luna	11	8	5	9	6	10	7	Ven.
Saturne	12	9	6	10	7	11	8	Mer.
Iupiter	0	10	7	11	8	12	9	Lun.
Mars	0	11	8	12	9	0	10	Satu.

till 9. a clocke, the houre proposed is 5. houres, which multiplied by 60. brings 300. that devided by 80. (the length of a planetarie houre,) brings in the quotient 3. houres &  $\frac{1}{2}$ : so I conclude that at 9. of the clocke, 3. planets haue past their Regiment, & the 4. hath ruled  $\frac{1}{2}$  of his houre: therefore vnder the title Sunday in the top of the Table, I looke for 4. toward the foote of the said table, against which on the left hand is placed Luna, therefore I say that the 17. of May being Sunday at 9. of the clocke in the morning, Luna shall haue raigned  $\frac{1}{2}$  of her houre.

*A Rutter*



*A Rutter, for the courses round about  
Ireland, from Cape to Cape, and what  
tides it makes in euery Harbor, and how  
many leagues it is from Harbor  
to Harbor.*

**I**n prims, from Cape cleare to the Mison head, is 7. leagues, & lieth west & by north & east & by south, you shal finde a Hauen north west from Cape cleare to Crook Hauen, and it floweth there east northeast and west southwest, you must goe west to enter into it.

From the Mison to the Durzib, is 7. leagues and lieth west north west and east south east.

Bear Hauen lieth from the Mison head, north north west 3. leagues and; you must go north west into the Hauen, it floweth east northeast and west southwest: if you will anchor betweene the Durzib and the maine land, you must goe aboord the Island, for the east side is not sound.

The 3. Islands that be off the point of the Dowries, which is called the Bull, the Cow, and the Calffe, they be sound, you may goe within them or else between them, for there is no danger but what you see.

Dowries and Blaskey lye north and by west and south and by east, and there is betwixt them 12. leagues, the Skellocks is betwixt both, and it floweth northeast and south west.

Porttheast of the great Skellocks a 3. leagues off you shal find the entry of Vallens, you must runne east southeast to enter in, it floweth east north east, you must borrow of the Island to enter

## The Sea-mans Kalender

in, for the point of the easter side is long.

North northeast of the great Skellocks 6. leagues of, you shall finde the Hauen of the Ventry, which is a good roade: it floweth east northeast.

N.E. by N. of the great Skellocks 7. leagues you shall finde the Hauen of Dinggell, and without the Hauen is a rock called the Croo, which is found on both sides: the rocke dooth not couer but on a spring tide, you must run northwest and by west into the Hauen, it floweth east northeast and west southwest.

The Ventry and the sound of Begue lye south by east and north by west 3. leagues, and when you are past into the sound of Begue, you must lye east and by north into the Roade against a red clift which is on the south side.

Southeast of the sound of Blaskey a 6. leagues of, you shall finde a good harbor named Begue which is to the northeast of Valence, the saide Hauen hath two entreyes, but the west side is the best, you must take heede of a sunck rock which is on the Islands side which you must leaue on your Harbor side going in, and it floweth east northeast and west southwest.

You shall vnderstand that the said sound of Blaskey, lyeth south east and northwest, but you must take heede of a sholde that is on the east side a thwart of the Sezebras.

From Blaskey to Smerrick is 3. leagues, and if you enter into the Hauen, you must go southwest into it: it floweth east northeast and west southwest.

There is a Hill to the eastward of Smerrick, which is called Sinbrandon, goe from Smerrick northeast by east & you shall goe with Lopus-head, which maketh entrey of the Riner of Lymerrick on the north side: there is from one to the other 10. leagues.

Smerrick and the head of the Kerry lye east northeast and west southwest 7 leagues asunder, and there is within the baye 3. Islands called Salline.

From Lawpshead to the Seatries is 7. lea. they lye east N.E. & W.S.W. & if you enter into the riner, take heed of a shold halfe way betweene Lawpshead and an Island called Statrick, which  
you



## The Sea-mans Kalender.

you must leaue on the north side, and to the eastward of that Island, is a good road, it floweth east north east, and west, South west.

From Scatricke to Quoine is five leagues, you must goe east, and you shall finde two Islands, they be flat Islands: goe you to the northwards, hard aboord them & from thence run East north east and you shall finde a Rocke called the Bieffe, goe hard aboard, the south side of the said rocke called the Bieffe.

And when you are at the said rocke, you must rowe South-east, and you shall finde another Rocke called the small Bieffe, then goe with the Island of the entrie of Dorsey and borrow aboard the Island as neere as you can for feare of the banke, going into the Hauen, and you must moor at the Castle by foure Cables, for there goeth a great tide, it floweth East northeast, and west south west.

The Sound of Blaskey, and the Islands of Arrin, lyeth north north east, and south south west, and there is betweene them. 16. leagues: the Islands lye east and west, and makes the entrance of Galloway, and of the other Islands: there is one which is nought, but the west sound is good, & the next sound to it is good, which is called the little sound, but the sound comming from the east is nought, but the next comming to the Black shore from the east, is partly good, but you must put the two partitions to the Island, for it is dangerous: you must vnderstand that there is one Island in the cource way, betwixt Lampshed and the entrie of Galloway, that hath a great Ranie, a league and  $\frac{1}{2}$  of the maine land.

If you goe before the Towne of Galloway, goe aboard the Black-shore, and bring the Black-shore south east of you: then goe northeast, and you shall fetch an Island called Motton Island, and there is betweene them both three leagues, you must not trust the North shore, for there is a sholde halfe way to the Black-shore, and the Island of Motton is thwart of two white points, which is on the North side.

The saide sholde is vpon the west south west side of the saide Island of Motton a league and  $\frac{1}{2}$ . of at a spring tide, then shall you

## The Sea-mans Kalender.

see it drie, and it floweth at the saide Iland, east northeast and west southwest.

The sound of S. Gregorye and the rode of Galue, lyeth east northeast and west southwest, and there is betwixt them 8. leagues.

The sound of S. Gregory and Siluis head, lye southeast and north west and the distance betwixt them is 9. leagues.

Slinthed and Black-rock lye south by east and north by west, and are distant 15. leagues.

Black-rock is an Iland which is west of Kill-head, a league off the Cape: the saide Black-rock and the Staggs lye north-east and southwest, and are distant 12. leagues.

From the saide Black-rock, runne north and you shall finde the Iland of east Euesky, and there is betweene them 2. leagues.

Southeast of the Staggs there is a Hauen called Broad hauen, from the Hauen to the Staggs is 4. leagues: the Staggs is a Cape that maketh the entry of the Riuer of Raffin, they lye east and west and are distant 8. leagues: the Staggs and the Cape of Tellen, ly northeast and southwest & are distant 15. leagues.

Betwixt the Staggs, and the Cape of Tellen in the Baye is the Hauen of Moye, the Hauen of Portwaye, the Hauen of Slego, the Hauen of Ballechennen, the Hauen of Dongall, the Hauen of Kellego, and the Hauen of Tellen.

The Cape of Tellen, and the Iland of Arron, lye north northeast and south southwest and are distant 7. leagues.

the Iland of Raghlenborne, and Tellen, lye southwest and northeast and are distant 2. leagues.

The Iland of Raghlenborne, and the Iland of Torre, lye north northeast and south southwest, and are distant 14. leagues.

To the eastward of Torre, is an Cape called Horne-head, and are distant 2. leagues: southeast of Horne-head is a Hauen called Sheep hauen, it floweth east and west, but you shall haue in the Baye a good roade for all Windes: the said Hauen is a broade Hauen, and is twoleagues from the Cape.  
Horne

## The Sea-mans Kalender.

Horne head and the entry of Loughfoile, lye east northeast and west southwest and are distant 6. leagues.

The entry of Loughfoile, and the Island of Enerster houlde, lyeth northeast and southwest and are distant 5. leagues.

The Island of Torre, and the Island of Enerster hould, lyeth east and by north west and by south, and are distant nine leagues.

The entry of Loughfoile, and Enerster hould, lye southeast and northwest and are distant 3. leagues.

The Isles of Enerster hould, and Skerris Portrush, lye east southeast and west northwest and are distant 10. leagues.

You must understand that the River of Loughfoile, lieth from Skerris Portrush, west southwest and east northeast, and there is betwixt them, the River of the Band: there is betweene Portrush and Loughfoile, 5. leagues: There is in the entry of Loughfoile, a Rock which is called the Tonnes, which is dangerous for any Ship of charge, also there is a Channell of the east side of the Tonnes, hard aboarde the shore, but you must haue your tide: it floweth east by south and west by north: Skerris Portrush and it, lyeth south and north and are distant 12. leagues.

Skerris Portrush, and the Islands of the Raghlenes, lye northeast and by east and southwest by west, and are distant 5. leagues, it floweth in Skerris east southeast and west northwest, the flood commeth from the eastward.

Off the Raghlenes is a Cape called the faire Forland, and betwixt them is a league and  $\frac{1}{2}$ . the faire Forland and the Knee lyeth south southeast and north northwest and are distant 9. leagues.

The faire Forland and Loughrian in Scotland, lye east southeast and west northwest, and are distant 15. leagues.

There is betwixt the Knee and Carickuergus, five leagues.

The



## The Sea-mans Kalender.

The point of Loughrian and the Islands of Commoras in Scotland lie north and south, and you must passe by Elliso, and by the haven of Lambach a sunder 17. leagues.

The point of Loughrian and Copman Isles, lyeth north east, and south west.

The Kneec and the rocke of the Maidens, lye north east by north.

The Kneec and Ellse in Scotland, lye north east by east, distant 10. leagues.

Loughrian in Scotland and the mould of Galue lyeth South South east, and north north west, and are distant 7. leagues.

The Mould of Galue, & the Calfe of Man lye south south east, and north north west, and are distant ten leagues.

The Copman Isles, and the roade of Carrick Vergus lye east and west, and are distant 4. leagues, it floweth in the south east south east, and west north west.

Copman Isles, and the point of the Moullens, lie south south east, and north north west, and are distant 7. leagues.

The point of the Moullens & the Ile of Lambay, lyeth south south west, and north north east, and are distant 21. leagues.

Lambay and Carlingford, lye north north west, and south south east, and are distant 14. leagues.

Lambay, and the Ile of Dalke, lie south south west, and north north east, and are distant 5. leagues.

The bancke of Wiclow beginneth thwart of the forth of Dublin, and containe to the Ile of Tosker, they lie north by west, and south by east, and they lie in length 24. leagues.

Tosker, and the point of the Grenord, lie east by north, & west by south, distant 2. leagues.

And when you are bound to the eastward of the Grenord, you must keepe the Mountaine of Washford above the low land, and so you shall goe cleare of all the dangers betwixt you and the shore: and if you close the Mount with the low land, then you shall go with the dangers.

Tosker and the cape of Canwall, lye south by east, and north by west. 40. leagues.

Tosker

## The Sea-mans Kalender.

Tosker and the Salts, lye east northeast and west south, west distant 6.leagues.

The Salts and Sillye, lye south and north, and are distant 33.leagues.

The Salts and the towne of Waterford, lye east and west, distant 5.leagues.

The towne of Waterford and the Ile of Ballacutin, lye south west and by west, and northeast by east, but betweene the towne of Waterford and Ballacutin, is a Haven called Yogh al, and a Sea-board it is an Island called Capell Ile, and betweene Capell Island and Ballacutin is 4.leagues.

The towne of Waterford and Heluick head, lyeth east and west, distant 3.leagues.

Capell Island and the Island of Ballacutin, lye west south, west, and east northeast and are distant 3.½.leagues.

Ballacutin and Cork Haven, lye west by south and east by north, and are distant 3.½.leagues.

Oyster Haven and the Old head of Kinsale, lye southwest and northeast, distant 3½.leagues.

The Haven of Kinsale lyeth from the Old head north northeast, and going in, you must keep Bane Castle open of the west land.

The Old head and Cape Cleare, lye west by south and east by north, and are distant 14.leagues.

Capeclear and Silly, lye east southeast, and west northwest, distant 50.leagues.

There lieth from Fasten, a Haven called Crok Haven and is from it northwest, distant 4.leagues.

There is a Haven called Scoll Haven which lieth from Fasten, north and by west, distant 5.leagues.

There is a head-land halfe waye betwixt the Old-head of Kinsale and Baltemore which is called Kendonetedo, and it lyeth north west by west: from it is a good haven called Clendor, there is a high land to the eastward, you must goe aboard that high land, and so into the haven. There is a raine of Rockes on the west land, that goeth to the eastwards, therefore keep the east

## The Sea-mans Kalender

side, and when you come in, Anchor befoze the Castle: there lieth west north west from the said head, a good Hauen called Castle-hauen, 4. leagues from it, and if you come out into the Sea, and meete with the Staggs, you must goe northeast into Castle-hauen, & in the entry there is an Island which you must leaue on the east side of you, and another flat Island which you must leaue on the west side of you, you may go dye at low water from it to the maine, for it is very nigh to the west land, but be bould on the easter Island, and go right with a Chappell that lieth on the east side of the maine Land, and when you are thwart of the Chappell you shall see a Castle on the west side, and thwart of the Castle you may enter in 12. fadame, it is from the Staggs 3. leagues.

You must vnderstand that the floud shuts from Dorze to the Old head of Kinsale, north northeast, and the ebe to the contrary, & from the Old head to the Towre of Waterforde, northeast and south west, and from the Dourze to the northwards, north northeast and south south west.

If you will go in betwixt the Cash and the Northhead of the groundes into Dalkye, you must bring a round hill that stands like a sugar loafe north north west, and then you shall haue 10. fatham, it floweth southeast alongst the Channel and the barre of Poulback, there is 8. foot water vpon it at lowe water, and 3. fatham at full Sea: your barre lieth south and north, and you shall haue in the roade of Poulback 14. foot at low water: to saile from Dalkye to the barre of Poulback, you must keepe a small rock open, a hand spack length, and when you come to the barre you must lye west south west vp into the road within the Beacon, then must you anchor in 4. fatham at high water, for there be 2. Hills, on the south side a high Hil and a low round Hill, bring them both in one, & you be in the best of the roade. A south south-east Moone, makes full Sea.

A note



## A Note for going into Dublin.

If you come for Milford, you must leave all the Islands to the west wards, & when you have the Grasham north north-west, then the Haven beareth northeast by north, and when you come into Dall rode, you may ride in 3. fathems. at low water: it floweth east by north.

Milford goeth in close under Cowein and Scabon, to the eastward, and when you come open of Milford, you shall see an Island like the Mawstone, which lieth on the east side, and in Dall rode you may ride for all windes, the Small lieth from the Grasham 3. leagues, and betwixt them lyeth a ledge of rockes, which is dry at low water, it lyeth midway, it is very dangerous conning betweene them.

*A Gene-*

The Sea-mans Kalender.

*A Generall and Compendious tide Table,*  
 shewing what Moone makes full Sea or high  
 water in all these places following.

*Full Sea on the Coastes of Iutland, Friezland, Holland,  
 Zeland, and Norway.*

At the Iutlandish Isles	fland, Wyering, and Amster-
Before the Rivers of	dam. S.W.
Heuer, Eyder and Elue.	Without the banks of Flan-
S. and N.	ders. S.W.
At Enchuisen. S. and N.	Dodrecht and Zierick Sea.
The Ile of Vrck before Delfe	S.W.
Ile, at Emden & all the shores	Rotterdam and from Harlem
of Flanders. S. & N.	to the River of Maes. S.W.
Before the Maers-deepe	At Ward-house. E. and W.
E. and W.	At Brihack. E.S.E.
At Hambrow and Antwerp	Cape Gallant. S. by E.
E and W.	The Hauens of Yotland and
Underneath Holiland, W. S.W	Norway. S. & N.
At Egmount and Harlem.	At Corpus Christi point
W, S.W.	S.S.W.
In the Bresond and Vourde	Before the Fen in the Chânel,
W.S.W.	At Horne, Edam, Ile of Gore,
Before the eastern and we-	Before the Maes, before Can-
stern entrances of the Emes,	fer and Teruer. S.S.W
or River of Emden, before all	Before the Willing and all the
the coast of Frisland and the	Coast of Zeland. S.S.W.
Flye S.E.	North-cape and Blangbrow
Before the Ghest of Texell.	S.W.
E.S.E.	Foxnose and S. Nicholas
Upon the flats of west Fri-	Rode. W.S.W.
	<i>Full</i>

# The Sea-mans Kalender.

Ful Sea on the Coast of France  
spaine, and Por-  
tugall.

**A**t Blacknesse, Armttry,  
Rammekins and Camfer.

Within the Fosse of Cane.

Callis Roads and Deepe.

At Boleine, Callis, Grauelin,  
& Dunkerke. tide

The Ile of Basse.

Within the Seine, before the  
Casquets, before Garnsey.

Before Cherborough and the  
Rase of Blanquert.

At Newport. tide.

At Seine head.

At Garnsey, and before Saint  
Poule.

Bellisle and Holy Ile.

Without Vihant, and before  
Burdeaux.

Brittaine, Penmark, Poitou,  
and Gascoine.

Race of Fovntnes.  
Bloy and S. Mathewes.

Abrowrath and Saint Ma-  
loes.

Before the Killiats.

Porthwisc, and before the riuer  
of Burdeaux.

From the Race to the Pole-

head.

Before the Riuer of Naunts, &  
before the Bay.

In the Bay within Vihant.

At the Sept Iles, and at Callice  
in the Creecke.

Within the Riuer of Roan,  
& from the Pole head of Burde-  
aux to the Forland of Foun-  
taines, before Brouage, in the  
Riuer within all the Hauens  
aforesaid it flowes.

At S. Iohn. de Luze

At Concalo, and Saint Malo,

At Cape Saint Maries,

Onal the coast of Biskay, Gas-  
lizia, Portugall and Spaine, it  
flowes south west, and north  
east.

## Scotland.

In S. Magnes sound.

At Faire Fles.

In the Frith.

Faire Ile Rodes.

At Orkney,

## England.

At Barwick it flowes.

At staples. tide.

At Howncliffe foote. tide.

N.E. by E

At Flarn-



# The Sea-mans Kalender.

At Flambro head $\frac{1}{4}$ tide	E.N.E	tide	E & w
At the shoos	s. & N	Betweene Cromer and Yarmouth rode	s. E
At Tinmoth $\frac{1}{4}$ tide	s. w	Betweene Laistoe rode and Orfordnes	s. E. by s
At the Spourne	w. by s	Betweene Orford and Orwell waues	s. s. E
Newcastle & Humber w. b. s	E. s. E	Betweene the Naze and the Ware heade of colne	s. by c
Winterton	E. s. E	At the west end of the Nore	s. by w
Black taile and the Nowre	s. by w.	Rochester and Maldon	s. b. w
Blakney & the shields	E. & w	At Grauesend	s. s. w
Yarmouth	s. E. by E	London and the midst of the heads of straights	s. w
Orford & Albrow	s. E. by s	At the north forland	s. s. E
Whitbay and Robin-hoods bay	s. w	At Beachy	s. & N.
Before Hartle poole	s. w	Seauen clifles	S. E
Scarbro $\frac{1}{4}$ tide	w. s. w	in the Downes	s. s. E
Hull & Lin halfe tide	E. & w.	in the Camber and at Goreend	S. by E,
Before Humber's mouth	N. w	At Cambernes and at the Needles	s. E. by s
At Burnham $\frac{1}{2}$ tide	E. & w	In Cambernes rode	s. s. E
Cromer	s. E	Porchmouth, Hampton and the Ile of Wight	s. and N
At Leislow quart. tide	s. s. E	In the Offing from the north Forland to $\frac{1}{2}$ south Forland, it runneth $\frac{1}{2}$ tide & fro $\frac{1}{2}$ south Forland to $\frac{1}{2}$ Nasse it runneth $\frac{1}{2}$ tide & halfe quarter tide, and from the Nasse to Fairly $\frac{1}{2}$ tide and from Fairlye to Beachy $\frac{1}{4}$ tide vnder other.	
Harwich & Douer	s. s. E	At Portland rode	E. s. E
Harwich within	s. b. E	At S. Ellens	s. E. by E
South Forland	s. s. E		Within
Before Margate & Thames mouth	s. by E		
Leigh & Kentish knock	s. & N		
Spits & a long the Swine	s. N		
Betweene Tinmouth and Flambro head	s. w		
Betweene Flambrow head & Bridlington bay	s. w. by w		
Betweene Bridlington and Lawrenas	w. s. w		
Betweene Lawrenas and Cromer a long the well, halfe			

## The Sea-mans Kalender.

Within the Race of Portland,  
at Poole in the Haven, at  
Home head, & thwart off Plim-  
mouth and Dartmouth s.E.

At Waymouth E.& w

At Famouth, Foy, Fourn,  
Plimouth & Dartmouth w.b.s

Bristow & Foulnes E.b.s

At the Start E.by s

Mouthole w.s.w

S. Davids head E.& w

Milford haven E.s.E

Isle of Man and Catnes s.E

3. leagues off the shore, at the  
Lizard to the shore, and to the  
Lands end E.s.E

Within Torbaye and in the  
Bay of Carnaruen w.b.s

At the mouth of Seuern, w.b.s

At the Moonles w.b.s

From the Lizard to the Sor-  
lings w.by s

Before Silly in the Channell  
E.& w

At Silly halfe tide s.s.w

Within Mounts baye and  
in the Sea of Wales and Seuern

W.s.w

At Lundy & the Holmes of  
Bristow E.& w

In the Sleecue betwene Silly  
and Vshant s.& N

Note that the floud setteth in  
at y east end of Wight till a.s.E.  
Hoone: in the roade at Dun-  
genesse south southeast, but wi-  
thout in the Channell a south-  
west Hoone full Sea: from the  
Seames, and in the broad sound  
betweene it and Vshant, the  
floud runneth east northeast &  
west southwest.

### Ireland.

At Caldys w.b.s

Waterford and Abermorick  
E & w

At Cape-cleare E.s.E

Macknells Castle s.E.by E

Dublin & Lambay s.E.b.E

Dunbar & Kildien s.E

Dungarun, Kinsale, Cork  
haven & Baltemore w.s.w.

## The Course

*The course of all the Coastes of Holland,  
Zealand, France and Spaine, vpon what  
point, and in what distance they are.*

From the Ile of Texel vnto Egmont.	S. & by w. leagues 5
From Egmont vnto the Maze.	s.s.w.l. 11
From the Maze vnto the Wieling.	s.w.l. 12
From the Wieling vnto the head of strait betweene Douer and Calice.	w.s.w.l. 18
From the Ile of Walkeren or Flushing vnto Calice.	s.w. & b.w.l. 22
From Blacknesse vnto Deepe.	s.s.w.l. 12
From Deepe vnto Seyne head, or the Riuer of Seyne.	w.s.w.l. 11
From the Seyne head to the Riuer of Cane.	s.w.l. 8
From thence vnto Cape de la Hague.	N.w.l. 12
From thence vnto the Caskets.	w. & by N.l. 8
From the Caskets to Garnsey.	s.w. & by w.l. 4
From Garnsey to S. Malo.	s.s.E.l. 10
From Garnsey to the sept Iles.	s.w. & by s.l. 12
From the seauen Iles to S. Poul.	w.s.w.l. 8
From thence to the Fourne.	w.s.w.l. 10
From the Caskets to the Fourne.	s.w. & by w.l. 34
From the Fourne to S. Mathewes point.	s.s.E.l. 3
From thence to Fontenau or Fonteynes.	s. & by E.l. 5
From Vshant to the seams, Seaboard it.	s.l. 7
From Fonteneau to the west Penmarques.	s.E.l. 7
From thence vnto the Ile of Croy.	E. & by s.l. 12
From the west Penmarques to Bel Ile.	E.s.E.l. 15
From thence to Heys somewhat more easterlye.	s.E.l. 12
From thence againe vntill within Piquelie	E. & s.l. 10
From thence againe vnto Croy sill.	E. & b.s.l. 9
From Piquelie vnto Heys.	s. & by w.l. 5
From Heys to the Kiliats.	E.s.E.l. 10
From the Ile of Heys to Porthuiss	s.E. & by E.l. 12
	from S.



# The Sea-mans Kalender.

from S. Martins Iland to the burning Ile	s:E:& by e:l:3
from the burning Ile to the Dyffer banke.	s:s:e:l:3
from S. Martins Ile to the Towre of Cordam	s.& by e:l:12
from thence vnto Bayone	s:e:n:l:28
from Bayone to Orio	w:s:w:l:5
from Orio vnto S. Iohn de Luz	e:s:e:l:6
from Orio vnto S. Andrew	w:& by s:l:20
from S. Andrew to Cape de Pennas	e:& w:l:30
from Cape de Pennas to Ribadeo	s:w:& b:w:l:12
from Cape de Pennas to Ortegal	w:& by w:l:20
from Ortegal vnto Ribadeo	s:e:l:14
from Ortegal vnto the Ile of Cizaega	s:w:& by w:l:13
from Cizaega vnto Coronna	e:s:e:l:6
from thence vnto Cap de Coriana	w:s:w:l:10
from Coriana to Cap Finisterre	s:e:n:l:3
from Finisterre vnto Bayone	s:e:& by s:l:14
from Bayone vnto Port de Port	s:s:e:l:18
from Port de Port to Aveiro	s:e:n:l:8
from Aveiro to Montega	w:s:w:l:5
from Montega vnto Barlinges	s:w:l:12
from Barlinges vnto Roxende	s:& by e:l:12
from Roxende to S. Vues point	s:e:& by s:l:8
from thence vnto Cape S. Vincent	s:e:n:l:24
from thence vnto Pharo	e:& w:l:14
from Pharo vnto Lepe	e:n:e:l:12
from Pharo to Saltees	e:n:e:l:18
from Saltees to Chipiona	s:e:l:8
from Chipiona to Calis Malis	s:e:l:6
from Calis vnto the straight of Gibraltar	s:e:l:8
from Calis vnto Cap de Cantin	s:w.& by s:l:60
from Cape de Cantin to the Ile of Madera	w:l:104
from Cape S. Vincen to Madera	s:w:& by w:l:115
from Roxende to Madera	s:w:l:130
from Rxende to the Ile of Tercera	w:l:210

# The Sea-mans Kalender.

## The Courses of England, Ireland, and Scotland.

From Boecknes vnto Leeth in Scotland	s.s.w.l:28
From Leeth vnto Barwicke	s.s.e.l:8
From Barwick vnto the Holy Ile	e.s.e.l:4
From S Abbes head to the easterne ende of Farne Isles	s.e.l:6
From the Isles of Farne to the Tees mouth	s,s,e,l:16
From the river of Tees to Flamborough head	s,e,& by e,l:14
From Flamborough head to Blackney	s.e.l:18
From Blackney vnto Winterton	s.e.l:8
From Winterton vnto Lestoff	s,& b,e,l:8
From Lestoff vnto Orford Haven	s,l:7
From Orford vnto the Foreland	s,s,e,l:13
From the Forland to Douer	s,l:5
From Douer to the Shingles, or the Nesse point, s,w,& b w,l:7	
From the Nesse point vnto the Beache	w,s:w,l:6
From the Beache to the Ile of Wight	w,& by s,l:15
From Wight vnto Portland	w:& by s:l:10
From Portland to the Start point	w:s:w:l:14
From the Start vnto Ramhead point	w:n:w:l:6
From Ramhead vnto Dodmans point	w:s:w:l:8
From Dodmans to the Lizart point	s:w:b:w:l:6
from the Lezard to the Isles of Sillye	w:l:12
from the Lezard to the Lands-end	w:n:w:l:8
from the Lands-end to the Ile of Lundy	n:e:l:14
from thence vnto the Holmes of Bristol	n:e:& b:e:l:16
from thence vnto the Ile of Caldie	w:s:w:l:25
from thence to the Isles of Salteys, on the Coasts of Ireland, west	n:w:l:20
from Salteys to Cape Cleere	w:s:w:l:25
from Cape Cleere to the Ile of Dorsey	w:l:12
from the point of Dorsey to the Ile Blakem	n:n:w:l:16
from Blakem vnto the Isles of Arran	n:n:e:l:14
from the Isles of Arran to Galwicke, or the Galfein Ireland, east	n:e:l:6
	Of diuers

*Of diners and sundrie Courfes over the Westerne Sea*

From the Texel on the Coastes of Holland, to Flamborough	w:n:w:l:45
from Tezel vnto Winterton in Norfolke	w:l:32
from the Ile of Tezel vnto Lestoffe	w:& by:s:l:28
from the Riuer of the Maze in south Holland vnto Harwich	w:l:26
from the said Maze to the Forland of England	w:& by:s:l:25
from the Marsdeepe in p. Holland, to y <sup>e</sup> said Forlād,	s:w:l:36
from the said Marsdeepe to Calice	w:& by:s:l:38
from Douer vnto Bolloyne	s:e:l:8
from Bolloyne vnto the Beache	w:l:16
from the Beache to Deepe in Normandy	s:e:l:18
from Deepe vnto the Ile of Wight	e:s:e:l:28
from Wight to the Seyne head or mouth	s:e:l:20
from the said Riuer of Seyne to Portland	w:n:w:l:30
from the Ile of Wight vnto the Caskets	s:w:& by:s:l:14
from Garnsey vnto S. Malo in Normandy	s:s:e:l:8
from the Caskets to Portland	n.& by:w:l:10
from the Caskets to the Start point	w,n,w,l,16
from the Start to the Septs Iles in Normandy	s,s,e,l,24
from the Strat to S. Poul in Normandy	s,& by w,l,22
from S. Poul to Portland	n,e,& by n,l,32
from the Fornes to Ramhead	n,n,e,l,28
from the Start point vnto Vshant	s,w,& by s,l,32
from the Fourne to the Lizard	s,& n,l,22
from Vshant to the Iles of Sillye	n,n,w,l,26
from the Sorlings to Milford Haueu	n,& by e,l,25
from the Sorlings to Wexford in Ireland	n,n,w,l,34
from the Sorlings to Cape Cleere	n,w,l,42
from Cape Cleere to Cape de Finisterre	s,& n,l,30
from the Lizard to Cape de Finisterre in Galicia	s,s,w,l,112
from Vshant vnto the Ile of Cizarga in Galicia	s,s,w,l,85
from Vshant to Laredo in Biscay	s,s,e,l,85



from the Seames rockes to S. Sebastian in Biscay South East &  
by s:l:90  
from Vihant againe to cape de Pennas in Biscay South and  
n:l:70  
from Bel Ile vnto Ortegall in Galicia s:w:l:75  
from S. Martins Ile to Ortegall w:s:w:l:85  
from Ortegall to cape de Coriana s:w:&b:w:l:124  
from cape de Finisterre to the Isles of S. Michael w:s,w:l:185  
from S. Michael to the Ile of Tercera n.w:l:26  
from cape de Finisterre to the Ile of Madera South west & by  
w.l:190  
from Madera vnto the great Ile Canarie s.e.& by e.l:60  
from cape de Finisterre to Bayone in Galicia s.e.&b.e.l:15  
from cape de Finisterre to the Ile Barlinges s.&n.l:50  
from the Barlinges in Portugal to the Ile Canarie s.s.w.l:170  
from the Ile of Madera to Calis Mahia e.n.e.l:150  
from Calis to cape de Cantin s.w.& by s.l:65  
from cape de S. Vincent to cape de Cantin s.&n.l:62  
From cape de Vincent vnto the Ile of Madera South west  
and by west, leagues 120  
From Roxen in Portugal vnto the Ile of Tercera e.&w.l:210

*The Courses of Norway, Swedeland, and East-finland.*

From Schuytenes to the Vesteen. s.& by e.l:14  
From Veesteen or Wollone to the Iedder s.s.e.l:4  
From the Iedder to the Vorsteen or Forstone s.e.l:5  
From the Forstone to the Noes e.s.e.l:6  
From the Noes vnto Reperwicke e.n.e.l:8  
From Reperwicke to Mardou n.e.l:10  
From Mardou vnto Iofferland n.e.l:8  
From Iofferland to Langhesondt n.n.e.l:1  
From Langhesondt to Ferderoer n.e.& by e.l:6  
From Ferderoer vnto Soenwater n.l:6  
From Ferderoer vnto Roeghe n.n.e.l:4  
From Ferderoer vnto Akerfond e.n.e.l:6  
From Akerfond to Maesterland s.e.& by e.l:4  
From Paters

# The Sea-mans Kalendor.

From Patet noster to Nydinke.	s.e.l.8
From nydinke to Waerberghe.	s.e.& by E.l.4
From Waerberghe to Swederoer	s.s.E.l.6
From Swederoer unto Col.	s.s.w.l.3
From Col unto Lappesand.	s.e.l.3.
From Lappesandt unto Ween.	s.s.e.l.2
From Ween unto Drakerriff.	s.& by E.l.7
From Drakerriff to Steden.	s.& by w.l.4
From Steden unto the North ende of Bornholme.	East and by north leagues 15
From Bornholme unto Anno.	N.& by w.l.8
From Anno unto the Rocks.	N.E.l.8
From the Rocks untill within the Calmerfond.	North North-East leagues 10
From Calmerfond to the Sweedish Ionckfrou.	N.N.E.l.8
From Ionckfrou to Landfoort.	N.N.E.l.8
From thence untill before Duyrhaven.	N.E.& by E.l.8
From the Stockhoms Schares to view of Abo.	N.E.& by N.l.24
From View unto Luns Vtschares,	E.N.E.l.28
From the Vtschares to the Ile Putsnagro.	E.& by N.l.30
From thence unto Somere.	e.& w.l.9
From Somere to the red Hole of Wiburgh.	N.e.l.9
From the Red-hole to Traelsand.	N.e.& by N.l.2
From thence unto Wiburgh	l.2

## Diuers Courses upon the whole Easterne Sea.

From Borniff to Bouen berghe.	N.N.e.l.45
From Bouen berghe to the Noes,	N.N.w.l.24
From the Noes unto the Ecmes.	s.& by E.l.58
From the Noes to Borniff,	s.& N.l.75
From the Noes unto the Ile of Walkeren in Zealand	s.& b.w.l.92
From the Noes to the Holmes before Yarmouth,	s.s.w.l.80
From the Noes unto Tynemouth.	s.w.& by w.l.78
From the Noes unto Bocknes,	w.l.68
From the Noes unto the Holmes,	s.e.l.17
From the Noes unto skaghen,	e.& w.l.25
From skaghen unto Mardou.	N.w.l.16

## The Sea-mans Kalender.

from fckaghen to Langhsond	N.N.w.l.16
from fckaghen to the Ferdet	N.& by w.l.15
from fckaghen to Maesterland	E.N.E.l.10
from fckaghen to the Trindell	s.E.& by E.l.7
from the Trindell of Lefou vnto Anout	s.E.l.8
from Anout to Col	s.s.E.l.9
from Col to Afelynon Zealand in Deamarke	s.w.& by w.l.8
from Afelyn to Steuens head	w.N.w.l.14
from Falsterbonet riffe to Wiumont	s.E.& by s.l.14
from Steden to Bornholme	E.& b.s.l.16
from Bornholme to Reefcol	E.& by N:l:20
from Bornholme to Coolsberghe	s:E:l:10
from Bornholme vnto the Rocke	N:N:E:l:15
from Bornholme to Houbrough	N:E:l:38
from Houbrough to Rigs-head	s:& N:l:28
from Houbrough to the Windou	E:N:E:l:26
from Ostergarde vnto the Windou	E:& w:l:20
from the Windou to Dageroort,	N:E:& by N:l:28
from Dageroort vnto the Gotsche sand	N:E:& by N:l:8
from Dageroort vnto Vieu	n:w:& by n:l:10
from Gotschesand to Bouschaer	n:& by E:l:15
from Marien vnto Elfenuos	n:n:e:l:14

### *The courses of Frisland, Iutland, Pomeran, Conrland and Liffland.*

<b>F</b> rom Mares deepth in Holland to Borniffe	n:e:l:10
from Borniffe to Wrangherooch	e:n:e:l:26
from Wrangherooch to Holyland	n.Δ.5
from Holy land to the Riuer of Elue	s e:& b:e:16
from Holy land vnto the Riuer of Eyder	e:& by n l:6
from Holy land vnto Rypen	n:e:& by n:l:12
from Rypen vnto Bouenbergh	n:n:w:l:25
from Bouenbergh to Holmen	n:n:e:l:6
from Holmen vnto Robbenknuyt	n e:l.8
from Robbenknuyt to Sckaghen,	n:n:e: l:9
from Sckaghen vnto Zebay	s:& by w:l:6
	from Zebay



# The Sea-mans Kalender.

from Zebay vnto Hals	s:& b:w:l:5
from Hals vnto Steuens-head	s:s:e:l:5
from Steuens-head to the great Helme	s:sw:l:6
from the great Helme vnto Wero	s:s:e:l:3
from Wero vnto Bolsacke	s:sw:l:3
from Bolsacke to Sproo	s:s:e:l:8
from Sproo vnto Longhland	s:e:l:3
from Longhland vnto Lalants haeck n2 hoocke	s:& n:l:7
from thence vnto Femeren	s:e:l:4
from the yle of Femeren to the Rae of Lubeck	s:s:w:l:8
from Rae to Cruycer-oort	n:e:& s:w:l:4
from Cruycer-oort vnto Robbennes	n,e,& b,e,l,12
from Robbennes to Witmont	n,e & b,e,l,8
from Witmont to Iasmont	s,e,& by e,l,2
from Iasmont to the Paert	s,s,e,l,2
from Paert vnto Colsberghe	e,n,e,l,12
from Colsberghe vnto Garshooft n2 head	n,e,& by n,l,10
from Garshead vnto Reefcol	e,n,e,l,4
from Reefcol vnto the Rissehehoof n2 head	e,n,e,l,12
from Rissehead vnto Heel	s,e,l,6
from Heel vnto the Wisse of Danzicke	s,& by w,l,4
from thence to Coninxberghe deepth	n,e,& by e,l,10
from thence to the Mamel	n,n,e,l,12
from the Mamel to Zeuenberghe	n,n,w,l,8
from Zeuenberow vnto the Windou	n,& by e,l,14
from the Windou vnto Lyseroer	n,e,& by e,l,4
from Lyseroert to Domsnes	e,n,e,l,8
from Domsnes vnto Runen	e,& w,l,6
from Runen vnto Rygh	s,e,l,12
from Rygh vnto Pernouth.	n,& by e,l,14
from Pernouth vnto the east end of the Osel	w,n,w,l,10
from thence vnto the Swalaweroort	n,e,l,14
from thence vnto Dagheroort	n,n,w,l,18
from thence vnto Zyburgsnes	n,e,l,6
from Zybourghsnes to Oitkens Holm	n,e,& by e,l,15
from Oitkins Holm to Narien	e,n,e,l,6
	from Narien

## The Sea-mans Kalender.

From Narien vnto Wrangher,	F.1.6
From Wrangher vnto eke-holm,	E. & by s.1.7
From eke-holme vnto the Narue,	E. & by s.1.12
from the Narue vnto the Ruffe-shaecke,	N.1.4
from the Ruffche-hooks to Wibrough,	N.E. & by N.1.6
From the High Iland vnto the Narue,	s.E.1.10
From Highland vnto Somere,	N.E. & b. E.1.10
From Highland vnto Narien,	w.s.w.1.20
From Narien to Luz by the Schaeres.	N,N,w.1.8
From Vieu vnto Boufchaer,	s.w. & b. s.1.12
From Boufchaer vnto the great Carel,	s.s.w.1.10
From thence to the South end of Goddandt,	s.E. & by s.1.6
From Houbergh vnto the Ryghs head	s. & by E.1.26
From Houbergh to the south end of Oeland.	s.w. by w.1.18
From Oelandt vnto Bornholme,	s.w. & by s.1.20
From Oelandt to the Rygish head.	s.E.1.22
From Bornholme to Witmond.	s.w.1.9
From Dorenbosch vnto Moen,	N,w.1.7
From Moen vnto Gheester riffe,	s.s.w.1.6
From Gheester riffe vnto Lubecke,	s.w. & by w.1.14

### *The Sea Courses on the Backside of Mosconie, and generally of all our Trafficks.*

<b>F</b> rom Candalex vnto Ombay,	s.E. & by E.1.10
From Ombay vnto Stalsland	s.E.1.8
From Stalsland vnto Warfiga.	c.s.e.1.12
From Warfiga vnto Caroa.	c,s,e.1.8
From Caroa vnto Karswick.	e.1.5
From Karswick vnto Pologni,	e,N,e.1.6
From Pologni vnto Sautsnawitz,	n:e:by e.1.6
From Sautsnawitz vnto the Iles.	n:n:e:1.10
From the three Iles to Orlogonos	n:n:w.1.14
From Orlogonos to Sweetonos	n:w: & by n.1.14
From Sweetonos to the Seuen Iles	s:e:1.18
From the seuen Iles vnto Kildin	s.1.24
From Kildin	

# The Sea-mans Kalender.

from Kildin to Lauwes	n:w:&b:n:l:8
from Lauwes to Ooster Hauen	s:e:l:10
from Ooster-Hauen to Waerhuys	n:w:&b:n:l:10
from Waerhuys to Matcroff	n:w:l:10
from Matcroff to northkin	w:n:w:l:12
from Northkin to the North Cape	e:&w:l:10
from the North Cape to Loppet to Trompsont	w:s:w:l:40
from Trompsont to Loffoote	s:w:l:38
from Loffoote to Rust	s:s:w:l:25
from Rust to Stad	s:w:m:2 s:l:90
from Stad to Berghen	s:&n:l:30
from Berghen unto Vvtliers	s:&:by:e:l:30
from Vvtliers to the Noes	s:e:l:29
from Schaghen to the Riffe	s,w:&:by w:l:24
from the Riffe to Calice by Flaunders	s:s:w:l:95
from the Heads to the Shingles to Nolle point	s:w:&b:w:l:9
from the Nolle point to Beachy	w:s:w:l:7
from Beachy to the Ile of Wight	w:&:by s:l:15
from Wight to the Start point	w:&:by s:l:26
from the Start to without Vshant	s:w:&b:w:l:36
from Vshant to Cizarga	s:s:w:l:86
from Cizarga to Cape de Finisterre	w:s:w:l:12
from Cape de Finisterre to the Burlings	s:&n:l:50
from Cape de Finisterre to the Tercera	w:&:by s:l:120
from Cape de Finisterre to the Ile Madera	s:w:&:by s:l:180
from Madera to the great Canarie	s:&:by:e:l:60
from Forteuentura to Palma	w:l:60
from Porto santo to Madera	s:w:l:10
from Porto-santo to Cape S Vincent	n:e:&:by e:l:104
from Cape S. Vincent to Lanes	e:&:by n:l:5
from Lanes to Pharo	e:&:by s:l:20
from Pharo to Cape de Maria to Auila	n:e:l:4
from Pharo to Leep	n:e:&:by e:l:13
from Pharo unto Saltees	e:n:e:l:18
from Cape de Maria to Rodun	e,&:by n:l:22
from Cape de Maria to Chipiona	e:l:23
	from Cape



## The Sea-mans Kalender

from Cape de Maria to Calis Malis	e:& by s:l:28
from Cape de Maria to the Staict	s:c:& by e:l:36
The Straict of Gibraltar hath his course throug	e:& by n:l:5
from the Straict of Gibraltar to Malaga	n:e:l:28
from Malaga to Almeria	e:l:28
from Almeria to Cape de Gates	e:& b;s:l:5
from Cape de Gates to new Cartagena	n:e:l:28
from Cape de Palo to Cape de Martin	n:n:e:l:32
from Cape de Martin to Valentia	n:n:w:l:10
from Valentia unto Tortosa	n:e:l:18
from Valentia to Cape de Calo	n:e:l:9
from Cape de Calo to Barzelona	n,e,& by e,l,16

## *The Depthes and Soundinges, neere di- uers Prouinces. And first of Gascoine, Poi- ctou and Britaine.*

**W**ithout the Riuer of Bourdeaux there is 14. fatham depth but when you come within the sight of Cordam tolnze, 30, fatham.

Duer against the Coast of poictou 16, leagues without Olesron you haue 25, fatham, but comming neare y land 8. Leagues from the shore, you haue 35. fatham: In the Cannell betweene Porthuys and Heys it is 30. fatham and as much in the Channell of Heys: as also betweene Heys & Belile: without the Channell is 35. fatham but within 25, without Heys two kennings off, there is found 45. fatham.

Twentie two Leagues Southward of Belile is 70, fatham, but 9, leagues from the North west point of thot Island, towards the South west is 60. fatham, and ouer against the midst of Belile in 40, fatham depth you shall see land. In your course betweene Belile & the Seames, you may come no neerer then 50, or 45 fatham, if you sayle from Belile west and by North: when you are against Gloyland you shall finde 60. fatham depth with-  
out,

## The Sea-mans Kalender.

out, and within the Rocks which standes off Gloyland to the Sea wards, you haue 40. fatha, water in 65. fatham depth, without the west Penmarkes you may saile north west by west without the Seames, but by night come no neerer then in 55. fatha, for the ground is grosse & red sand full of round stints: halfe a league West south west of the Seames is a ledge of rocks, where you haue 7. fatham depth, but betweene the Seames and the Rocks is 50. fatham.

In the Channell betweene the Seames and Vshant is 55. fathā depth, the ground is grosse and red sand, with little round stones red and blacke: Peere to Vshant is 45. fatham, but within it is of a variable depth: south west almost 6. Leag. of Vshant you haue 70. fatham, and the ground is fine white sand, with little white shelles, and other small thinges like needles, and then is Vshant East from you: but if the sand be grosse and white, mingled with great and white shelles, then it is South east to you, but if you doubt of these groundes, goe Northwesterly, if your sound bee deeper, then are you towards the Seames, but if not so deepe, then are you in the Channell almost North of Vshant.

Betweene Vshant and Obeuracke in the trade it is 60. fathā depth betweene Vshant and the Sorlings in the midst of the channell there is 70. fatham betweene the Seames and Vshant in 70. fatham water, the ground is of little blacke stones easie to bee broken and of yelow earth or clay, but if you finde red and hard sand, goe Northward til you happen on white sand mingled with long streaks, and then you are in the Channel.

If from Cizarga you saile North North East in the Spanish Seas towards Vshant, and finde your selfe in 80. fatham, you are 14. or 15. leagues of Vshant, but coming nearer, you shal haue 70. fatham water and be 10. leag. from Vshant, but if you finde the ground to be yelow shels and little blacke stones, then are you toward the Seames, therefore you must with the tide beare off Northward to shun Vshant untill you finde white sand, & thinges like needles, for such are the groundes of the Channell.

Betweene Vshant and the Ile of Base when you saile at so ure fatham water, you are 4. leagues off the shoare, but by nighe  
come

## The Sea-mans Kalender.

come no neere then 25. fatham : when you are two Leagues off Obeurack, you shall finde 25. fatham depth, but 8. Leagues off the Sept Ilands you haue 55. fatham.

A League without the rockes of Obeurack, there is a blinde or hidden rocke, so that if you are to sayle vpon aboord betweene the Fournes and Obeurack come no neere the blinde rocke then 40. fatham, but Eastward you may sayle in 30. or 25. fatham.

If a Ship sayling w. S. w. and southwest by West of Silly, at 80. fatham water, be found to be vnder 49. degrees 15. minutes of Altitude, there is 26. leagues from land, and must goe East & by North till she get 66. fatham water, for then she is in the Channell betweene Silly and Vihant, and then if she be bound for England, she must sayle more Northward, and betweene the Lands end and the Lizard she shall haue 55. fatham depth.

## *The soundings and groundes betweene Ireland, England, and Normandy.*

**T**hree Leagues without the Isles of Dorsey neere Ireland, it is 45. fatham deepe, in the Channell betweene Dorsey and Cape Clear is 42. or 43. fatham, the Channell from Cape Clear to Saltees hath 45. fatham, but 2. Leagues off Ireland it hath but 40. betweene Saltees and Milford it is 44. fatham deepe, and betweene Lundy and Silly 38. fatham in the midway betweene Silli & Milford is 44. but North of Silly 40. and 42. and neere England by the Lands end, the channell is of 50. fatham depth.

Coming from Cape Finisterre sayling N. N. E. if you haue 80. fatham, you are 20. leagues off the shoare, and the ground is small blacke stones with great red sand: in the same course, when you haue but 60. fatham, you are within 12. or 14. leagues of the shoare, but shall not so soone ken land as you thinke for you shall a great while haue 60. fatham: being at the N. parts of the channell about Silly betweene Vihant & Silly the channell is 70. fath. on the S. side of Silly the ground is small red stones, and fine white



## The Sea-mans Kalender.

White sand: Duer against the Lizard & Falmouth 4. leag. from  
Shore is 52. fatham betwixt Foy and Plimouth sound, in the  
channell highest is 60. fatham, betweene the Lizard & the Start,  
beare no fierer the shore then 35. fath. you may cast anchor in  
the trade or channell in 25. fath. and so shall you lye within the  
Foreland streame: betweene Plimouth and the Sept-Iles, in the  
midst of the Channell is 55. fath: but 4. Leag. S, S, W, off Plimouth  
is but 35. fath. S, S, E, of the midland of the Start is 45. fath: but  
from thence 5, or 6, leag. S, E, is 54. fath. in the channell  
between the Caskettes & Portland is 40. fa, & a lea, S, of the Ile  
of Aldernay is a hole or pit 80. fath deep, all the rest of the chan-  
nell between Portland & Aldernay is of equall depth. viz 40. fat.  
when you are within kenning of Portland, your sounding is 34,  
fath: and 3, leagues off Wight 36. fath, also 2. leagues Eastward  
of Beachy: between Picardy and Wight the Chânel in the midst  
is 38. fatham: betweene Winchelsey and Picardy 24. fatham: the  
shoals between the heads called the Vrowen-sand, hath but  
three fatham, and a half, but on the south side of it, is 24 fatham:  
and in all the sayre way between Zealand & Douer it is 24. fa:  
tham deepe.

## *Depths of the North Sea from the Foreland.*

**I**n the Channell from Englands Foreland, & sandes of Flan-  
ders, you haue 24, fathā deepe: but 3, lea, S, W, by W, of the  
countrie of Zierickze called Botbrecke, it hath but 4, fatham  
depth: without this shoald the channell of Zealand is 26, fatham  
S, W, of Harlem, 8, or 9, miles within the sea, there beginneth  
a shelve called de breede Verthien, reaching alongst the Coast of  
Holland to the plaine of Ameland, where it endeth: ouer against  
Harlem and Egmond, is 13, 14. or 15, fatham, and the ground is  
ful of Dase mingied with black sand like mustard-seede: the said  
shelve hath 15, 16, or 17, fatham depth. betweene Texell & Vlie-  
land, where the ground is grosse red sand, 6, or 7, leagus from the  
shore

shoore, for there the shoald is narrower then it is towards the end of the channel: without the shoald between Zealand and Texel is 26. fatham deep, as farre as the shoald which the fishers call Dogland. In the channel on England side, ouer against Yarmouth is 35. fatham, but against Flamborough & Scarborough point 38. fath, whereas the white shelve called Dogland beginneth, reaching into the North seas to the Channell of Helichland: this shoale where it is within kening of Flamborough point, hath but 9. or 10 fath. but when in the same sand you finde 12. fatham, then Texell is from you south east, almost 30. leagues, but when you are come to 16. fatham: then are you within 21 leagues south southeast of Vlyeland.

A Ship that comes from the Riffe, finding 18. fath. depth on the aforesaid sand, is then 20. leagues south and by east of Vlyeland: but at 22. fatham must then sayle towards the Vlyc south and by West, and south south west: but if in the Channell of Helichland, 24. or 26. fatham be found, then must you sayle South west and South west by South, and then you are come to the Schellingh: but if in Helichland sound you haue 27. fatham, then are you altogether to the east ward of it: betweene the Riffe and the Doggerland: the channell is 26. fatham: without the channel westward, it is 32. fatham deepe.

A ship that comes out of the English Straights, or out of Zealand hauing at the Riffe 24 fatham, is from the Naes in Norway 18, leagues North by east: but hauing 20 fatham is 16. leagues from it North: and finding but 18. fatham, is then 18. leagues off it North by west: the course from thence to the Holmes is 12. Leagues north by E. from thence to the point of Scakghens 18. Leagues North east by east, there is a Roke of one fatham depth North East and North east by East of the Holmes, two Leagues from shoare.

### Depthes neere Iutland and Ameland,

**I**n y Sea without Iutland, a mile from Dodenberg, is a bāk, called Reefeorne stretching out .8 Leagues west by south, in some

## The Sea-mans Kalender.

some places but three fatham deepe, and in some places may be sailed ouer, and become a Roade for a North West and a S. wind in 20, fatham from Ameland towards the sea, the ground is grosse sand, Red and black, mingled with shelles: three Southwards in 16, fatham sayling three houres, you shall come to the smooth Sea of Ameland, where the ground is fine sand, with shelles S. from Schelling in 24. fatham, is fine white sand, and in 18. fatham white & blacke sand mingled. Vlyeland hath white Sand with shelles, and thin blacke sand in 16. fatham depth. from the west ende of Vlyeland is great & red sand mingled with blacke like vnto Mustard seed about sixe or seauen leagues from shore, at the east ende of Schellingh to Seawards, at eightene fatham is fine white sand, mingled with blacke, hauing in it things like needles. Duer against Borcke in the Westerne Ems at 17. or 18. fatham depth, land may bee seene: the ground is grosse grauelly sand; at 14 fatham may Ameland bee kend, but Schellingh at 16. & Vlyeland at 15 or 16, fatham water. At the North Hook of Texel, land may be seene at 16. fatham: Holland at 14 or 15. when you saile within the shoald called the Breduerchien, which beginneth north west of Harlem, and stretcheth alongst the Coast of Holland, to the west end of Vlyeland, and is 7 or 8 leagues from the shoare.

## *Soundings and ground neere the Schaw.*

**A** Great leag. w-by S. from the Schaw, is 35, fatham depth: S. S. E. a great leag. off the corner of this point is 38 fath, and when the point is northeast from you, then you haue 17, fath. Betweene this point and Leson, the chanel is 20. fa. deepe, & the ground like clay or durt: betwixt Anhout & Waersbergh in the midst of the channell is 22, fatham water: between Leson & Anhout the ground is fine and stony: neere Waersbergh is a shoald of 17, fatham depth: betweene Anhout & Coll is another shoald of 17, fatham, where sometimes it is troublesome like a wicke poole.

*Depthes*



*Depths of the Easterne Seas.*

**B**etweene Oeland and Gothland, the soundings are vnequat, sometimes of 20, sometimes of 23, fatham the ground grosse and blacke stonie sand, like Pease: when the S. end of Oeland is 2, lea. from you westwards, you haue 27, fatham, where also you may gage water: but whē the Chappell in Sudernoordē beareth West  $\frac{1}{2}$  p. w. of you, then haue you 31 fatham, and ground fit to gage water: ouer against the Rooke in the faire way is 52, fatham, and a clay ground, but fit for gaging: betweene the greater and lesser Carla is 14, fatham, vnder which is safe road for ships: there is a shoald between Houberg & Ostergard 24, fath, depth: the ground great red sand, but hardly from thence can you ken Gothland out of the top: there is also to the eastward another shoald of 36 fatham, which when you are past, you haue more then 40 fatham water: when the point of Righ is 3 leagues south E. from you, then haue you 30 fatham: but when it is from you halfe a leag, south S. E. you haue but 15, fatham: the ground is white sand: but when it beareth west a small league from you, then you shall finde 16, fatham: ouer against Heel halfe a league from the shoare it is almoste 3, fatham deepe: the roade for ships at Heel, hath 25, fatham depth: between Moan & Falsterborne is 14, fatham depth, between Sted and Falsterborne in the very Channell it is but 12, fatham deep: neere Falsterborne it is full of shoaldes, but neere Sted you haue 13, fatham water: betweene Darkeriff and Southolmen, which is more shoaldy, there is five fatham wanting two foote: from thence toward the sound it is sometime deeper, as, 6, 7, 8, 9, 10, fatham.

*A note of certaine and moste dangerous places in the Sea.*

**T**he principal and most perrillous of all, is the Maelstream, well or florp called the Mouskstream; which lyeth on the backe side

## The Sea-mans Kalender

backside of Norway in 68. degreen on the Northside of an Island or  
 Rocks called Weeray. This well draweth the water vnto it selfe  
 during the whole flood (which is the space of 6 houres & 12 mi.)  
 with such an indraught & force, & with such a noyse, through the  
 tumbling and falling of the waues & streames one vpon the other,  
 that it is rather to wonder at then to write of, so that during that  
 time, within the space of more then, 2 leagues round about that  
 rock of Mousk (vnder which that water floweth) no ship or other  
 vessell may come neere, for they should to their vtter destruction  
 be drawne into it & swallowed vp: but all the time of the ebbe the  
 water is so strongly cast bp againe, that no kinde of substance or  
 mettell, how heauie soeuer it be, can there sink. Now the North-  
 ren Fishers at that time doe with their Gollen or fishing boates,  
 take many & strange formed fishes, which they draw into their  
 boates with hookes & lines: which they haue readie layde for that  
 purpose: for that during the ebbe, they cannot returne into the  
 gulph nor get vnder the water by any meanes.

The Northren people that inhabite about those Rocks, doe  
 thinke that that streame passeth away vnderneath a part of Nor-  
 way vnto the North bottome in East-Finland: because in that  
 place there is likewise such a Maelstream (though not altogether  
 so strong nor dangerous) where the like fishes are taken: and the  
 water is in like sort troublesome, as it is vnderneath & about the  
 Rocks of Mousk.

Whereupon many experimented Pilots doe call the said Slorp  
 the Pauell of the Sea, which causeth the courses of the Ebbes &  
 Floods about all the Lands that are on this Northside of the E-  
 quinoctiall, as the most conuenient place for that purpose to  
 spreade the waters South, North, East and West: that is to say,  
 Northerly towards the Pole Articke South Easterly on the  
 backside of Russia and Tartarie; towards the straight of the  
 great southsea called Mar del Sur, wherein the spicerie Islands cal-  
 led the Molluccas, neare the Equinoctiall are lying southward  
 toward the Northsea of these Low Countries: as also on the  
 backside of Scotland and Ireland, toward the Spanish and At-  
 lanick seas: and towards the Northwest beyond Island to-  
 wards

## The Seaman's Kalender,

wards Furbuschers Straits, where it is thought the way unto Catay may be found.

There are more ouer to be feared vpon the Westerne Seas verie dangerous streames and gulphs as is the Race of Portland, where often times hapneth such turning and tumbling of waues and streames, that the ships which passe that way are many times in great perill.

Moreouer the race of Blanquet betweene Normandy and the Ile of Alderney roseth and rageth so dangerously, that many ships fall therein head long, so deep, that sodainly they are swallowed vp and sunck vnto the very bottome.

The race of Founcey is more dangerous then al these, where in many small vessels and barks of Brittainy and of other countries, are sodainly deuoured and cast away, and the entrance of the Garrone, called the River of Burdeaux betweene the towres of Condom, and the southerne and northerne Asles is likewise very perillous, and many ships do often perish there, if the Pilotes be not skilfull and well acquainted with the place.

And these aforesaid being the most full of danger, it behoueth each pilote or maister to haue especiall knowledge thereof, and great care to preuent the danger that may ensue vnto them thereby.

## The yeares for which the Tables of the Sunnies place and Declination following serues.

Leape yere.	Firft.	Seco.	Thir.
1608	1609	1610	1611
1612	1613	1614	1615
1616	1617	1618	1619
1620	1621	1622	1623
1624	1625	1626	1627
1628	1629	1630	1631

Heere after



Heereafter followeth a most excellent, necessarie and com-  
pendious Kalender, shewing the Prime, Epact, Dominicall let-  
ter, Leap yeares, & Mooveable Feasts, for twentie foure yeares  
Inclusiuey comprehending therewith the true day & houre  
of the Moones Coniunction or Change, for 19. yeares to  
come: with the true place of the Sun, and his Declina-  
tion from the Equinoctiall, both northwards, and south-  
wards, vppon euery degree thereof, through the 12  
monthes of the yeare.

Year of our Lord	Prime.	Epact.	Letter.	Sunday.	First Sun- day in Lent	Easter day.	Ascen- tion day.	Whit- sun- day.	Trinity Sunday.
1605	10	20	F		Febr. 17	Mar, 31	May. 9	May, 19	May, 26
1606	11	1	E		March 9	Apri, 20	29	Iune, 8	Iune, 15
1607	12	10	D		Febr, 22	5	14	May, 24	May. 31
1608	23	23	CB		14	Mar, 27	5	15	22
1609	14	4	A		March 5	Apri, 16	25	Iune. 4	Iune. 11
1610	15	15	G		Febr, 25	8	17	May. 27	3
1611	16	26	F		10	Mar, 24	2	12	May. 19
1612	17	7	ED		March 1	Apri, 12	21	31	Iune, 7
1613	18	18	C		Febr, 21	4	13	23	May, 30
1614	19	29	B		Marc, 13	24	Iune, 2	Iune, 12	Iune: 19
1615	1	11	A		Febr, 26	9	May 18	May, 28	4
1616	2	22	GF		18	Mar, 31	19	19	May, 26
1617	3	3	E		Marc, 9	Apri, 20	29	Iune, 8	Iune. 15
1618	4	14	D		Febr, 22	5	14	May, 24	May. 31
1619	5	25	C		14	Mar, 28	6	16	23
1620	6	6	BA		March 5	Apri, 16	25	Iune 4	Iune. 11
1621	7	17	G		Febr, 18	April, 1	10	May, 20	May. 27
1622	8	28	F		Marc, 10	21	30	Iune, 9	Iune: 16
1623	9	9	E		2	13	22	1	8
1624	10	20	DC		Febr, 15	Mar, 28	6	May 16	May, 23
1625	11	1	B		Marc, 6	Apri, 17	26	Iune, 5	Iune: 12
1626	12	12	A		Febr, 26	9	18	May, 28	4
1627	13	23	G		Marc, 11	Mar, 25	3	13	May: 20
1628	14	4	FE		2	Apri. 13	22	Iune, 1	Iune: 8

The Prime		Fast.	Leng. of the day. H.M.	Declination and true place in v <sup>e</sup> Leape yere		in v <sup>e</sup> First yere	
				D.M, D.M.		D.M. D.M.	
	1	A New.	7 52	1	20 40 21 54	1	21 26 21 48
5.viii.	2	B yerres d.	7 54	2	21 41 21 45	2	22 27 21 38
	3	C	7 58	3	22 42 21 35	3	23 28 21 28
xvi.4.	4	D	8 0	4	23 43 21 25	4	24 29 21 17
	5	E Fast.	8 4	5	24 44 21 15	5	25 30 21 6
7.v.	6	F Twelue	8 6	6	25 45 21 4	6	26 31 20 55
xiii.2.	7	G day.	8 9	7	26 46 20 52	7	27 32 20 43
ii.	8	A Lucian.	8 12	8	27 47 20 40	8	28 33 20 31
5.x.	9	B	8 15	9	28 49 20 28	9	29 35 20 18
	10	C	8 18	10	29 50 20 15	10	30 36 20 5
xviii.	11	D	8 21	11	30 51 20 1	11	31 37 19 51
	12	E	8 24	12	31 52 19 48	12	32 38 19 38
4.vii.	13	F Hillari.	8 30	13	32 53 19 34	13	33 39 19 23
	14	G	8 33	14	33 54 19 20	14	34 40 19 9
xv.	15	A	8 36	15	34 55 19 5	15	35 41 18 54
iii.3	16	B	8 40	16	35 56 18 51	16	36 42 18 39
xii.10.	17	C	8 43	17	36 57 18 35	17	37 43 18 23
	18	D	8 46	18	37 58 18 20	18	38 44 18 8
i.i.	19	E	8 49	19	38 59 18 4	19	39 45 17 51
	20	F Fabian.	8 52	20	39 59 17 47	20	40 45 17 35
10.ix.	21	G Agnes.	8 55	21	40 11 17 31	21	41 46 17 19
xvii.	22	A Vincēt.	8 58	22	41 12 17 14	22	42 47 17 1
	23	B	9 0	23	42 13 16 57	23	43 48 16 44
8.vi.	24	C	9 2	24	43 14 16 39	24	44 49 16 26
xiii.3.	25	D conuer.	9 4	25	44 15 16 22	25	45 50 16 9
iii.10.	26	E of Paul.	9 6	26	45 16 16 4	26	46 51 15 50
	27	F	9 9	27	46 17 15 45	27	47 51 15 31
5.xi.	28	G	9 12	28	47 18 15 26	28	48 52 15 12
	29	A	9 15	29	48 19 15 8	29	49 52 14 54
5.xix.	30	B	9 18	30	49 20 14 49	30	50 53 14 34
	31	C	9 21	31	50 21 14 30	31	51 54 14 15

South Declination.

January.					
of the Sunne.					
☉ in 2 <sup>d</sup> yere			☉ in 3 <sup>d</sup> yere.		
D.M.D.M.			D.M.D.M.		
1	21	11	21	49	South Declination.
2	22	12	21	40	
3	23	13	21	30	
4	24	14	21	20	
5	25	15	21	8	
6	26	16	20	57	
7	27	17	20	46	
8	28	18	20	34	
9	29	20	20	21	
10	☉	21	20	8	
11	1	22	19	54	
12	2	23	19	41	
13	3	24	19	27	
14	4	25	19	12	
15	5	26	18	58	
16	6	27	18	42	
17	7	28	18	27	
18	8	29	18	12	
19	9	30	17	56	
20	10	30	17	39	
21	11	31	17	23	
22	12	32	17	6	
23	13	33	16	48	
24	14	34	16	31	
25	15	35	16	13	
26	16	36	15	55	
27	17	36	15	36	
28	18	37	15	17	
29	19	37	14	59	
30	20	38	14	40	
31	21	39	14	20	
1	20	55	21	52	South Declination.
2	21	56	21	43	
3	22	57	21	33	
4	23	58	21	23	
5	24	59	21	12	
6	26	0	21	0	
7	27	1	20	49	
8	28	2	20	37	
9	29	4	20	24	
10	☉	4	20	11	
11	1	5	19	58	
12	2	7	19	45	
13	3	8	19	30	
14	4	9	19	16	
15	5	10	19	2	
16	6	11	18	46	
17	7	12	18	31	
18	8	13	18	16	
19	9	14	17	59	
20	10	14	17	43	
21	11	15	17	27	
22	12	16	17	10	
23	13	17	16	52	
24	14	18	16	35	
25	15	19	16	18	
26	16	20	15	59	
27	17	20	15	41	
28	18	21	15	22	
29	19	21	15	4	
30	20	22	14	44	
31	21	23	14	25	

Certaine of the moſte notable Fixed Stars of the 1. 2. & 3. bignes, their Magnitude, Declination and right aſcention whereby you may readily finde when any of them are in rule for obſervation.

1  
Whales taile is a ſtarre of the 3. bignes, whole declination is 20. deg. 12. minutes ſouth, and the right aſcention thereof is 24. minutes of an houre.

2  
Whales backe of the third bignes, declination 12. deg. 20. minutes ſouth, and right aſcention 50. minutes.

3  
Rams hozne is a ſtarre of the third bignes, whole declination is 17. degrees 17. min. north, and his right aſcention is 1 houre 32. mi.

4  
Rams head of the third bignes, declination 21. degrees 33. minutes north, right aſcention 1. houre 46. minutes.

D 3 Februarie



Februarie hath 28. daies.

The Prime.			Leng. of the day.	Declination and true place.			
				☉ in ♀ Leape year		☉ in ♀ First yer	
				H.M.	D.M	D.M	D.M
8.viii	1	D	Fast.	9 30	1 22	9 14	10 1 22 54 13 55
	2	E	Purific.	9 33	2 23	9 13	50 2 23 55 13 35
5.xvi.	3	F	of Mary.	9 37	3 24	10 13	30 3 24 56 13 14
v,5.	4	G		9 41	4 25	11 13	10 4 25 56 12 54
xiii.ii,	5	A	Agathe.	9 45	5 26	11 12	50 5 26 57 12 34
3.ii,	6	B		9 50	6 27	11 12	29 6 27 57 12 13
x.10.	7	C		9 54	7 28	12 12	8 7 28 58 11 52
	8	D		9 58	8 29	12 11	47 8 29 58 11 31
	9	E		10 2	9 0	X 13	11 26 9 0 X 58 11 10
4.xviii.	10	F		10 6	10 1	13 11	5 10 1 59 10 48
	11	G		10 9	11 2	14 10	43 11 2 59 10 26
ii.vii.	12	A		10 12	12 3	14 10	21 12 3 59 10 4
xv.3,	13	B		10 15	13 4	14 9	59 13 4 59 9 42
	14	C		10 18	14 5	14 9	37 14 6 0 9 20
ii,iiii:	15	D	Valent.	10 22	15 6	15 9	15 15 7 0 8 58
4.xii.	16	E		10 26	16 7	15 8	53 16 8 0 8 35
	17	F		10 30	17 8	15 8	30 17 9 0 8 13
9.i:	18	G		10 34	18 9	15 8	7 18 10 0 7 50
ix,8,	19	A		10 37	19 10	15 7	44 19 11 0 7 28
	20	B		10 40	20 11	15 7	22 20 12 0 7 5
7:xvii.	21	C		10 46	21 12	15 6	59 21 13 0 6 42
vi,5,	22	D		10 50	22 13	15 6	36 22 14 0 6 19
	23	E	Fast.	10 54	23 14	15 6	13 23 15 0 5 55
10,xiii,	24	F	Mathia.	10 58	24 15	15 5	49 24 16 0 5 32
3.iii,	25	G	when it is	11 2	25 16	15 5	26 25 17 0 5 9
xi,8,	26	A	leap year	11 7	26 17	15 5	3 26 18 0 4 45
	27	B	February	11 12	27 18	14 4	39 27 18 59 4 22
	28	C	hath 29:	11 16	28 19	14 4	16 28 19 59 3 58
10.xix,	29		daies, and then is S: Mathias the 25:da		29 20	14 3	52

South Declination.

# Februarie.

## of the Sunne.

☉ in the second yere

☉ in the third yere

D,M, D,M		South Declination	D,M D,M		
1	22 39	14 0	1	22 24	14 6
2	23 40	13 40	2	23 25	13 45
3	24 41	13 20	3	24 26	13 25
4	25 41	13 0	4	25 26	13 4
5	26 41	12 40	5	26 26	12 44
6	27 42	12 20	6	27 26	12 24
7	28 42	11 58	7	28 27	12 3
8	29 43	11 36	8	29 27	11 42
9	30 43	11 15	9	30 28	11 21
10	1 44	10 53	10	1 28	11 0
11	2 44	10 31	11	2 29	10 38
12	3 44	10 10	12	3 29	10 16
13	4 44	9 48	13	4 29	9 54
14	5 45	9 26	14	5 29	9 32
15	6 45	9 4	15	6 30	9 10
16	7 45	8 41	16	7 30	8 48
17	8 45	8 18	17	8 30	8 24
18	9 45	7 56	18	9 30	8 2
19	10 45	7 33	19	10 30	7 39
20	11 45	7 11	20	11 30	7 17
21	12 45	6 48	21	12 30	6 54
22	13 45	6 25	22	13 30	6 31
23	14 45	6 2	23	14 30	6 8
24	15 45	5 38	24	15 30	5 44
25	16 45	5 15	25	16 30	5 21
26	17 45	4 52	26	17 30	4 58
27	18 45	4 28	27	18 29	4 34
28	19 44	4 5	28	19 29	4 11

<sup>5</sup>  
Bulls eye is a starre of the first bignes, whose declination is 15. degrees 38. minutes north, and right ascension 4. houres 13. minutes.

<sup>6</sup>  
Orions left foote of the first bignes, declination 8. degrees 42. minutes south, right ascension 4. houres 55. minutes.

<sup>7</sup>  
Orions left shoulder of the second bignes, declination 5. degrees 56. minutes north, right ascension 5. hou. 4. minutes.

<sup>8</sup>  
First in Orions girdle of the second bignes, declination 38. minutes south, right ascension 5. houres 12. minutes.

<sup>9</sup>  
Orions right shoulder of the first bignes, declination 6. degrees 17. minutes north, right ascension 5. houres 34. minutes.

March

March hath 31 daies.

The Prime.			Leng. of the day.	Declination and true place.					
				☉ in X Leape yere			☉ in X First yere.		
				H, M,	D, M, D, M,		D, M, D, M,		
viii, 8, xvi. 7	1	D	Dauid.	11 20	1 21 14	3 30	1 20 59	3 35	
	2	E		11 24	2 22 14	3 6	2 21 59	3 11	
	3	F		11 28	3 23 13	2 42	3 22 58	2 47	
	4	G		11 32	4 24 13	2 18	4 23 58	2 23	
8, v, 3, xiii. ii, 11,	5	A		11 36	5 25 13	1 55	5 24 57	2 0	
	6	B		11 40	6 26 12	1 30	6 25 57	1 36	
	7	C		11 44	7 27 12	1 7	7 26 57	1 13	
	8	D		11 48	8 28 11	0 43	8 27 56	0 50	
x, 3, xviii, 7,	9	E		11 52	9 29 11	0 21	9 28 55	0 26	
	10	F		11 56	10 0 10	0 4	10 29 55	0 2	
	11	G	Gregor.	12 0	11 1 9	0 28	11 0 54	0 22	
	12	A		12 4	12 2 9	0 52	12 1 53	0 45	
vii, 4. 9, xv. 2, iiii. xii: 7, i: 1:	13	B		12 8	13 3 8	1 15	13 2 53	1 9	
	14	C		12 12	14 4 7	1 38	14 3 52	1 32	
	15	D		12 16	15 5 6	2 2	15 4 51	1 57	
	16	E		12 20	16 6 5	2 25	16 5 50	2 19	
ix: 2: xvii: 6 8, vi, 1, xliii, iii, 8, 2, xi. xix. 7.	17	F	Edward	12 24	17 7 5	2 49	17 6 49	2 42	
	18	G		12 28	18 8 4	3 13	18 7 49	3 6	
	19	A		12 32	19 9 3	3 36	19 8 48	3 30	
	20	B	Benedic	12 36	20 10 2	3 59	20 9 47	3 53	
	21	C		12 40	21 11 1	4 22	21 10 46	4 16	
	22	D		12 43	22 12 0	4 45	22 11 45	4 39	
	23	E		12 47	23 12 59	5 9	23 12 44	5 2	
	24	F	Fast.	12 50	24 13 58	5 32	24 13 43	5 26	
	25	G	Anuntia	12 54	25 14 57	5 54	25 14 42	5 48	
	26	A	tion of	12 58	26 15 55	6 17	26 15 41	6 11	
	27	B	Mary.	13 3	27 16 54	6 40	27 16 39	6 34	
	28	C		13 6	28 17 53	7 3	28 17 38	6 57	
	29	D		13 10	29 18 52	7 25	29 18 37	7 19	
	30	E		13 14	30 19 50	7 47	30 19 36	7 42	
	31	F		13 20	31 20 49	8 9	31 20 35	8 3	

South Declination.

North Declination.



March.

of the Sunne

☉ in ✕ second yere

☉ in ✕ third yere

D.M. D.M.

D,M, D,M,

1	20 44	3 41
2	21 44	3 18
3	22 43	2 54
4	23 43	2 30
5	24 42	2 6
6	25 42	1 43
7	26 42	1 18
8	27 41	0 56
9	28 40	0 32
10	29 40	0 8
11	0 39	0 16
12	1 38	0 39
13	2 38	1 3
14	3 37	1 27
15	4 36	1 50
16	5 35	2 13
17	6 34	2 36
18	7 34	3 0
19	8 33	3 24
20	9 32	3 48
21	10 31	4 10
22	11 30	4 33
23	12 29	4 56
24	13 28	5 19
25	14 26	5 42
26	15 26	6 5
27	16 24	6 28
28	17 23	6 50
29	18 22	7 13
30	19 21	7 36
31	20 19	7 57

South Declination

North Declination.

1	20 29	3 47
2	21 29	3 24
3	22 28	3 0
4	23 28	2 36
5	24 28	2 12
6	25 28	1 49
7	26 28	1 25
8	27 27	1 1
9	28 26	0 38
10	29 26	0 14
11	0 25	0 10
12	1 24	0 34
13	2 23	0 57
14	3 22	1 21
15	4 21	1 44
16	5 20	2 8
17	6 19	2 31
18	7 19	2 54
19	8 18	3 18
20	9 17	3 42
21	10 16	4 4
22	11 15	4 28
23	12 14	4 50
24	13 13	5 14
25	14 12	5 37
26	15 11	5 59
27	16 9	6 23
28	17 8	6 45
29	18 7	7 8
30	19 6	7 30
31	20 4	7 51

The great Dog is a starre of the first bignes, whose declination is 16. degrees 12 minutes southwards, and his right ascension is 6. hou. 27. minutes.

11

The little Dog is a starre of the first bignes, declination 6. degrees 13. minutes north, right ascension 7. hou. 18. minutes.

12.

Brightest in Hidra is a starre of the second bignes, declination 6. degrees 53. minutes south, right ascension 9. houres 8. minutes.

13

Lyons heart of the first bignes, declination 13. degrees 55. minutes north, right ascension 9. houres 57. minutes.

14

Lyons neck of the second bignes, declination 21. degrees 52. minutes north, right ascension 9. houres 46. minutes.

April

April hath 30. daies.

The Prim.			Len. of the day	Declination and true place						
				H.M.	Declination		true place			
					in V	Leape yer	in V	First yere		
				H.M.	D.M.	D.M.	D.M.		D.M.	
viii:	1	G		13 30	1 21	48	8 31	1 21	33	8 25
8:xvi:	2	A		13 34	2 22	46	8 53	2 22	32	8 47
v.	3	B		13 38	3 23	45	9 15	3 23	30	9 9
xiii:7:	4	C	Ambro.	13 42	4 24	43	9 36	4 24	29	9 31
	5	D		13 46	5 25	42	9 58	5 25	28	9 52
ii:2:	6	E		13 50	6 26	40	10 19	6 26	26	10 14
	7	F		13 53	7 27	39	10 40	7 27	24	10 35
5:x:	8	G		13 56	8 28	37	11 1	8 28	23	10 55
	9	A		13 59	9 29	35	11 22	9 29	21	11 16
xviii:3:	10	B		14 2	10 05	34	11 43	10 05	19	11 37
	11	C		14 5	11 1	32	12 3	11 1	18	11 57
8:vii,	12	D		14 8	12 2	30	12 23	12 2	16	12 18
xv:	13	E		14 12	13 3	29	12 43	13 3	14	12 38
iiii:7:	14	F		14 16	14 4	27	13 2	14 4	13	12 57
	15	G		14 20	15 5	25	13 21	15 5	11	13 17
6,xii,	16	A		14 24	16 6	23	13 41	16 6	9	13 36
i,	17	B		14 28	17 7	21	14 0	17 7	7	13 55
	18	C		14 32	18 8	19	14 19	18 8	5	14 15
5:ix,	19	D		14 36	19 9	17	14 37	19 9	3	14 33
	20	E		14 40	20 10	15	14 56	20 10	1	14 51
xvii,	21	F		14 44	21 11	13	15 14	21 10	59	15 10
vi:	22	G		14 47	22 12	12	15 32	22 11	57	15 27
xiii:7:	23	A	S.Geor.	14 50	23 13	10	15 50	23 12	56	15 46
	24	B	Fast.	14 53	24 14	7	16 7	24 13	54	16 3
3:iii.	25	C	S.Mark.	14 56	25 15	5	16 25	25 14	51	16 20
	26	D		14 59	26 16	3	16 41	26 15	49	16 37
xi.	27	E		15 2	27 17	1	16 57	27 16	47	16 53
	28	F		15 5	28 17	59	17 14	28 17	45	17 10
xix,	29	G		15 8	29 18	57	17 30	29 18	43	17 26
-	30	A		15 12	30 19	55	17 46	30 19	41	17 41

North Declination.

April.  
of the Sunne.

☉ in ♊ secondyere

	D.M	D.M
1	21 18	8 19
2	22 17	8 41
3	23 15	9 3
4	24 14	9 25
5	25 12	9 46
6	26 11	10 8
7	27 9	10 30
8	28 8	10 50
9	29 6	11 11
10	08 4	11 32
11	1 3	11 52
12	2 1	12 12
13	2 59	12 33
14	3 58	12 53
15	4 56	13 12
16	5 54	13 32
17	6 52	13 50
18	7 50	14 10
19	8 48	14 29
20	9 46	14 46
21	10 44	15 5
22	11 42	15 23
23	12 41	15 41
24	13 39	15 59
25	14 36	16 16
26	15 34	16 33
27	16 32	16 49
28	17 30	17 5
29	18 28	17 22
30	19 26	17 38

North Declination

☉ in ♊ thirdyer\*

	D.M	D.M
1	21 3	8 14
2	22 2	8 35
3	23 0	8 58
4	23 59	9 20
5	24 57	9 42
6	25 56	10 3
7	26 54	10 24
8	27 53	10 45
9	28 51	11 6
10	29 49	11 27
11	08 48	11 47
12	1 46	12 7
13	2 44	12 28
14	3 43	12 47
15	4 41	13 7
16	5 39	13 26
17	6 37	13 46
18	7 35	14 5
19	8 33	14 23
20	9 31	14 42
21	10 29	15 0
22	11 27	15 19
23	12 26	15 36
24	13 24	15 54
25	14 21	16 11
26	15 19	16 28
27	16 17	16 45
28	17 15	17 1
29	18 13	17 18
30	19 12	17 34

15

Lyonsback is a starre of the second bignes, whose declination is 22: degrees 43: minutes northward, and his right ascension is 10: houres 52: minutes.

16

Lyons taile of the first bignes declination 16: degrees 50: minutes north, right ascension 11: houres 29: minutes.

17

Rauens wing of the third bignes, declination 15: degrees 16: minutes south, right ascension 11: houres 56: minutes.

18

Virgins spike of the first bignes declination 9: degrees south, right ascension 13: houres 5: minutes.

May



May hath 31. daies.

The Prime			Fast:	Leng. of the day.	Declination and true place					
					☉ in & Leape yere			☉ in & First yere		
					H.M.	D,M, D.M.		D.M. D.M.		
I I.viii:xvi	1	B	Phi.&I.	15 16	1	20 54	18 2	1	20 39	17 57
V:7.	2	C		15 20	2	21 52	18 17	2	21 37	18 13
	3	D	Inuenti.	15 23	3	22 49	18 31	3	22 35	18 28
8,xii,	4	E	croffe,	15 26	4	23 46	18 46	4	23 33	18 42
	5	F		15 29	5	24 44	19 0	5	24 30	18 56
7,ii,	6	G	Io port.	15 32	6	25 43	19 14	6	25 28	19 11
5.ii.	7	A	Latin.	15 35	7	26 39	19 27	7	26 26	19 24
	8	B		15 38	8	27 38	19 41	8	27 23	19 38
	9	C		15 40	9	28 34	19 54	9	28 21	19 51
9:xviii.	10	D		15 42	10	29 33	20 6	10	29 18	20 3
vii.i.	11	E		15 44	11	30 29	20 18	11	30 16	20 15
xv.8.	12	F		15 46	12	1 28	20 31	12	1 13	20 28
	13	G		15 48	13	2 25	20 42	13	2 11	20 39
8.iiii.	14	A		15 50	14	3 23	20 53	14	3 9	20 51
xii.6.	15	B		15 53	15	4 21	21 4	15	4 6	21 1
	16	C		15 56	16	5 18	21 14	16	5 4	21 12
8:i.	17	D		15 58	17	6 15	21 25	17	6 1	21 22
ix.9.	18	E		16 0	18	7 13	21 34	18	6 59	21 32
xix.	19	F	dunstan	16 3	19	8 9	21 44	19	7 56	21 41
xvii.	20	G		16 6	20	9 8	21 52	20	8 53	21 50
vi,8	21	A		16 9	21	10 4	22 1	21	9 51	21 59
	22	B		16 12	22	11 2	22 9	22	10 48	22 7
9.xiii.	23	C		16 14	23	11 59	22 17	23	11 45	22 15
iii 10:	24	D		16 16	24	12 56	22 25	24	12 43	22 22
	25	E		16 18	25	13 54	22 31	25	13 40	22 29
xi.4.	26	F	August.	16 20	26	14 52	22 38	26	14 37	22 36
	27	G		16 22	27	15 48	22 45	27	15 35	22 42
	28	A		16 24	28	16 45	22 50	28	16 32	22 49
	29	B		16 26	29	17 43	22 55	29	17 29	22 55
viii.	30	C		16 27	30	18 39	23 0	30	18 26	22 59
	31	D		16 28	31	19 38	23 5	31	19 24	23 05

North Declination.

May.

of the Sunne.

☉ in 8 second yere

☉ in 8 third yere

D,M,	D,M
1 20 25	17 54
2 21 23	18 9
3 22 21	18 25
4 23 19	18 39
5 24 16	18 53
6 25 14	19 7
7 26 12	19 21
8 27 9	19 34
9 28 7	19 47
10 29 4	20 0
11 0 2	20 12
12 0 59	20 25
13 1 57	20 37
14 2 55	20 48
15 3 52	20 59
16 4 50	21 10
17 5 47	21 20
18 6 45	21 30
19 7 42	21 39
20 8 39	21 48
21 9 37	21 56
22 10 34	22 5
23 11 31	22 13
24 12 29	22 21
25 13 26	22 28
26 14 23	22 35
27 15 21	22 41
28 16 18	22 48
29 17 15	22 53
30 18 12	22 58
31 19 9	23 4

North Declination

D,M	D,M
1 20 10	17 50
2 21 8	18 5
3 22 6	18 21
4 23 4	18 35
5 24 1	18 49
6 24 59	19 4
7 25 57	19 18
8 26 54	19 31
9 27 52	19 44
10 28 49	19 57
11 29 47	20 9
12 0 44	20 22
13 1 42	20 34
14 2 40	20 45
15 3 37	20 56
16 4 35	21 7
17 5 32	21 17
18 6 30	21 27
19 7 27	21 37
20 8 24	21 46
21 9 22	21 54
22 10 19	22 3
23 11 16	22 11
24 12 14	22 19
25 13 11	22 26
26 14 8	22 33
27 15 6	22 40
28 16 3	22 46
29 17 0	22 52
30 17 57	22 57
31 18 55	23 3

19

Arcturus or betwixt boots  
thighes, is a starre of the first  
bignes, whose declination is  
21:degrees 20:minutes north,  
and his right ascension is 13:  
houres 56:minutes.

20:

South Balance of the se-  
cond bignes, declination 14:  
degrees 14:minutes south,  
right ascension 14:houres 30:  
minutes.

21

North Balance of the se-  
cond bignes, declination 7: de-  
grees 46:minutes south, right  
ascension 14:houres 55: mi-  
nutes.

22

Scorpions heart is a starre  
of the first bignes, whose de-  
clination is 25: degrees 25:  
minutes south, right ascension  
16:houres 6:minutes.

June

June hath 30. daes.

The Prim.			Len. of the day	Declination and true place.					
				☉ in II Leape yer			☉ in II First yere		
				H.M.	D.M.	D.M.	D.M.	D.M.	D.M.
9:v:	1	E	16 28	1	20	35	23	9	1 20 21 23 9
xi.i:z:	2	F	16 28	2	21	33	23	14	2 21 18 23 13
	3	G	15 29	3	22	30	23	17	3 22 16 23 16
ii:8:	4	A	16 29	4	23	28	23	20	4 23 13 23 20
	5	B Bonifa.	16 29	5	24	24	23	23	5 24 10 23 23
x:3:	6	C	16 29	6	25	21	23	25	6 25 7 23 24
	7	D	16 30	7	26	19	23	27	7 26 4 23 26
xviii:	8	E	16 30	8	27	16	23	28	8 27 2 23 28
vii:8:	9	F	16 30	9	28	13	23	29	9 27 59 23 29
	10	G	16 30	10	29	10	23	30	10 28 56 23 30
9:xv:	11	A Barnab.	16 30	11	29	7	23	30	11 29 53 23 30
iii,4	12	B	16 30	12	1	5	23	30	12 29 50 23 30
	13	C	16 30	13	2	2	23	29	13 1 48 23 29
4,xii,	14	D	16 30	14	2	59	23	28	14 2 45 23 28
i,6,	15	E	16 30	15	3	56	23	26	15 3 42 23 27
	16	F	16 30	16	4	53	23	24	16 4 39 23 25
3,ix,	17	G	16 29	17	5	51	23	22	17 5 36 23 23
xvii.8:	18	A	16 29	18	6	48	23	19	18 6 34 23 20
vi,5,	19	B	16 28	19	7	45	23	16	19 7 31 23 17
	20	C Edward.	16 27	20	8	42	23	13	20 8 28 23 13
xiii,	21	D	16 26	21	9	39	23	8	21 9 25 23 10
	22	E	16 25	22	10	36	23	4	22 10 22 23 6
iii,	23	F Fast.	16 24	23	11	34	22	59	23 11 19 23 1
	24	G Iohn Ba	16 23	24	12	31	22	54	24 12 17 22 55
5,xi	25	A	16 22	25	13	28	22	49	25 13 14 22 51
	26	B	16 20	26	14	25	22	43	26 14 11 22 45
xix.	27	C	16 18	27	15	22	22	37	27 15 8 22 38
iii,8	28	D Fasty	16 16	28	16	20	22	30	28 16 5 22 31
9,xvi,	29	E S. Peter.	16 14	29	17	17	22	23	29 17 3 22 25
v	30	F	16 13	30	18	14	22	15	30 18 0 22 17

North Declination.



☉ in II second yer.

☉ in II third yer.

	D.M	D.M		D.M	D.M
1	20	7	23	8	
2	21	4	23	12	
3	22	2	23	15	
4	22	59	23	19	
5	23	56	23	22	
6	24	53	23	24	
7	25	50	23	26	
8	26	48	23	28	
9	27	45	23	29	
10	28	42	23	30	
11	29	39	23	30	
12	0	36	23	30	
13	1	34	23	30	
14	2	31	23	29	
15	3	28	23	28	
16	4	25	23	26	
17	5	22	23	24	
18	6	20	23	21	
19	7	17	23	18	
20	8	14	23	14	
21	9	11	23	11	
22	10	8	23	6	
23	11	5	23	3	
24	12	3	22	57	
25	13	0	22	52	
26	13	57	22	46	
27	14	54	22	40	
28	15	51	22	34	
29	16	49	22	27	
30	17	46	22	19	
1	19	52	23	6	
2	20	49	23	11	
3	21	47	23	14	
4	22	44	23	18	
5	23	41	23	22	
6	24	38	23	23	
7	25	35	23	25	
8	26	33	23	27	
9	27	30	23	29	
10	28	27	23	30	
11	29	24	23	30	
12	0	21	23	30	
13	1	19	23	30	
14	2	16	23	29	
15	3	13	23	28	
16	4	10	23	26	
17	5	7	23	24	
18	6	5	23	22	
19	7	2	23	19	
20	7	59	23	15	
21	8	56	23	12	
22	9	53	23	7	
23	10	50	23	3	
24	11	48	22	58	
25	12	45	22	53	
26	13	42	22	48	
27	14	39	22	42	
28	15	36	22	35	
29	16	34	22	28	
30	17	31	22	21	

North Declination

Hercules head is a starre of the third bignes, whose declination is 14. degrees 57: minutes north, and right ascension 16:houres 56: minutes.

24

Eagles heart is a starre of the second bignes, declination 7: degrees 54: minutes north, right ascension 19: houres 32: minutes.

25

Dolphins taile of the third bignes, declination 10: degrees north, right ascension 20:houres 16:minutes.

26

Goats taile of the third bignes, declination 17. degrees 51: minutes south, right ascension 21:houres 27:minutes.

July hath 31 daies.

The Prime.			Leng. of the day.	Declination and true place.			
				in ☿ Leape year		in ☿ First yere	
				H.M	D.M D.M	D.M D.M	
10.xiii,	1	G	Visitati.	16 12	1 19 11 22 8	1 18 57 22 9	
	2	A	Mary.	16 10	2 20 8 21 59	2 19 54 22 1	
	3	B	Martin.	16 8	3 21 6 21 50	3 20 51 21 52	
4.ii,	4	C		16 6	4 22 3 21 41	4 21 49 21 44	
	5	D		16 4	5 23 0 21 32	5 22 46 21 34	
9,x, xviii.8,	6	E	Dog.da	16 1	6 23 57 21 22	6 23 43 21 25	
	7	F	begin.	15 57	7 24 55 21 12	7 24 40 21 15	
9.vii.	8	G		15 54	8 25 52 21 1	8 25 38 21 4	
	9	A		15 51	9 26 49 20 51	9 26 35 20 54	
2,xv,	10	B		15 48	10 27 47 20 39	10 27 32 20 43	
	11	C		15 46	11 28 44 20 28	11 28 30 20 31	
7.iiii.	12	D		15 44	12 29 41 20 16	12 29 27 20 19	
	13	E		15 41	13 30 39 20 3	13 30 24 20 7	
xii:11,	14	F		15 38	14 1 36 19 51	14 1 22 19 54	
	15	G	Swithin	15 35	15 2 33 19 38	15 2 19 19 42	
5.ii:	16	A		15 32	16 3 31 19 25	16 3 16 19 28	
	17	B		15 29	17 4 28 19 11	17 4 14 19 15	
ix:7.	18	C		15 26	18 5 25 18 58	18 5 11 19 2	
	19	D		15 23	19 6 23 18 43	19 6 8 18 47	
5,xvii, vi,	20	E	Margr.	15 20	20 7 20 18 29	20 7 6 18 32	
	21	F		15 17	21 8 18 18 14	21 8 2 18 18	
xiii,9,	22	G	Magda.	15 13	22 9 15 17 59	22 9 1 18 3	
	23	A		15 10	23 10 13 17 44	23 9 58 17 47	
9,iii,	24	B	Fast.	15 7	24 11 10 17 29	24 10 56 17 32	
	25	C	S.James	15 5	25 12 8 17 12	25 11 53 17 16	
xi,10,	26	D	Anna.	15 3	26 13 5 16 56	26 12 51 17 0	
	27	E		15 0	27 14 3 16 39	27 13 48 16 43	
xix,8,	28	F		14 58	28 14 0 16 23	28 14 46 16 27	
	29	G		14 55	29 15 58 16 5	29 15 43 16 10	
xvi:8:viii: v.	30	A		14 52	30 16 56 15 48	30 16 41 15 53	
	31	B		14 50	31 17 53 15 30	31 17 39 15 34	

North Declination

July  
of the Sunne.

☉ in 2 second		North Declination	☉ in 2. thir dyc	
D.M	D.M		D.M	D.M
1 18 43	22 11		1 18 28	22 13
2 19 40	22 3		2 19 25	22 5
3 20 37	21 55		3 20 22	21 56
4 21 35	21 46		4 21 20	21 48
5 22 32	21 37		5 22 17	21 39
6 23 29	21 27		6 23 13	21 29
7 24 26	21 18		7 24 11	21 20
8 25 24	21 7		8 25 9	21 9
9 26 21	20 56		9 26 6	20 59
10 27 18	20 46		10 27 3	20 48
11 28 16	20 34		11 28 1	20 37
12 29 13	20 23		12 28 58	20 25
13 0 10	20 10		13 29 55	20 13
14 1 8	19 57		14 0 53	20 0
15 2 5	19 45		15 1 50	19 48
16 3 2	19 32		16 2 47	19 35
17 4 0	19 18		17 3 45	19 21
18 4 57	19 4		18 4 42	19 8
19 5 54	18 50		19 5 39	18 33
20 6 52	18 36		20 6 37	18 39
21 7 49	18 22		21 7 35	18 25
22 8 47	18 6		22 8 32	18 10
23 9 44	17 51		23 9 29	17 55
24 10 42	17 36		24 10 27	17 40
25 11 39	17 20		25 11 24	17 25
26 12 37	17 4		26 12 22	17 8
27 13 34	16 47		27 13 19	16 52
28 14 32	16 31		28 14 17	16 35
29 15 29	16 15		29 15 14	16 19
30 16 27	15 57		30 16 12	16 2
31 17 25	15 40		31 17 10	15 44

27  
Pegasus shoulder of the 2.  
bignes, declina 12. degr. 58  
min. North, right ascension  
22. houres 46. minutes.

28  
Pegasus Leg, of the third  
bignes, declination 25. degr  
58: minutes north, right as-  
cension, 22. houres 44 min.

29  
Swans taile, is a Starre of  
the second bignes, whose  
declination is 43, degrees  
54. minutes right North  
ascension 20. houres 30 mi-  
nutes.

30  
The Wagons right  
shoulder is a starre of the  
second bignes, declination  
44. degrees 49. minutes  
north, and right ascension 5  
houres 30. minutes.

31  
Hircus the Goate of the  
first bignes, declination 45  
degrees 50. minutes, right  
ascension 4. houres 49, mi-  
nutes

32  
Lira of the first rignes, of  
north Declination, 38: de-  
grees 30. minutes, right as-  
cension 18. houres 20. mi-  
nutes.

August



August hath 31. daies.

The Prime.			Leng. of the day.	Declination and true place.			
				in N. Leape		in N.	
				H.M.	year. D.M. D.M.	First. D.M. D.M.	
	1	C	Lamas	14 46	1 18 51 15 13	1 18 36 15 17	
	2	D		14 42	2 19 48 14 54	2 19 34 14 59	
10.ii:	3	E		14 38	3 20 46 14 36	3 20 31 14 41	
x.4.	4	F		14 34	4 21 44 14 18	4 21 29 14 23	
	5	G		14 30	5 22 42 13 59	5 22 27 14 4	
8.xviii:	6	A		14 26	6 23 50 13 40	6 23 25 13 45	
2.vii:	7	B		14 22	7 24 37 13 21	7 24 23 13 25	
xv.7:	8	C		14 18	8 25 35 13 1	8 25 20 13 6	
	9	D		14 15	9 26 33 12 42	9 26 18 12 47	
iiii.7:	10	E	Lauré.	14 12	10 27 31 12 23	10 27 16 12 28	
	11	F		14 9	11 28 29 21 2	11 28 14 12 7	
xii.2:	12	G		14 6	12 29 27 11 42	12 29 12 11 47	
i.6:	13	A		14 5	13 01 25 11 21	13 01 10 11 27	
	14	B		14 0	14 1 23 11 1	14 1 8 11 6	
8.x:	15	C		13 56	15 2 21 10 39	15 2 6 10 45	
1.xvii:	16	D		13 52	16 3 19 10 19	16 3 4 10 25	
vi.8:	17	E		13 50	17 4 17 9 58	17 4 2 10 4	
	18	F		13 44	18 5 15 9 36	18 5 0 9 42	
3.xiii:	19	G		13 40	19 6 13 9 14	19 6 58 9 20	
	20	A		13 35	20 7 11 8 54	20 7 56 8 59	
iii.7:	21	B		13 30	21 8 9 8 32	21 8 54 8 37	
	22	C	Fast.	13 25	22 9 8 8 10	22 8 52 8 16	
xi:	23	D	Bartho.	13 20	23 10 6 7 48	23 10 51 7 53	
	24	E	apostle.	13 15	24 11 4 7 26	24 11 49 7 32	
8.xix.	25	F		13 10	25 12 2 7 4	25 12 47 7 9	
xvi.10.viii	26	G		13 6	26 13 1 6 42	26 13 45 6 47	
	27	A		13 2	27 13 59 6 19	27 13 44 6 25	
v.1.	28	B		12 58	28 14 58 5 55	28 14 42 6 2	
	29	C	Behed.	12 54	29 15 56 5 33	29 15 41 5 39	
5.xiii.	30	D	of Iohn.	12 51	30 16 54 5 11	30 16 41 5 16	
	31	E		12 48	31 17 52 4 48	31 17 40 4 52	

North Declination

August, 1581

of the Sunne

in 2. second		in 2. third y:	
D.M	D.M	D.M	D.M
1 18 22	15 22	1 18 7	15 26
2 19 20	15 4	2 19 3	15 8
3 20 17	14 46	3 20 2	14 50
4 21 15	14 27	4 21 0	14 32
5 22 13	14 9	5 21 58	14 13
6 23 11	13 49	6 22 56	13 54
7 24 9	13 30	7 23 54	13 35
8 25 6	13 11	8 24 51	13 16
9 26 4	12 52	9 25 49	12 57
10 27 2	12 32	10 26 47	12 37
11 28 0	12 12	11 27 45	12 17
12 28 58	11 52	12 28 43	11 57
13 29 56	11 31	13 29 41	11 36
14 30 54	11 11	14 30 39	11 16
15 1 52	10 49	15 1 37	10 55
16 2 50	10 29	16 2 35	10 35
17 3 48	10 8	17 3 33	10 14
18 4 46	9 47	18 4 31	9 53
19 5 44	9 26	19 5 29	9 31
20 6 42	9 4	20 6 27	9 10
21 7 40	8 42	21 7 25	8 49
22 8 38	8 21	22 8 23	8 27
23 9 37	7 59	23 9 22	8 5
24 10 35	7 37	24 10 20	7 43
25 11 33	7 15	25 11 18	7 21
26 12 31	6 53	26 12 16	6 59
27 13 30	6 30	27 13 15	6 36
28 14 28	6 7	28 14 13	6 14
29 15 26	5 45	29 15 12	5 51
30 16 25	5 22	30 16 10	5 28
31 17 23	5 0	31 17 8	5 6

North Declination

53  
Perseus right side of the second bignes, Declination, 48. degrees 22. minu. north right ascens. 2. ho. 56. minu.

34  
Fomahand is a starre of the first bignes having south Declination, 33. deg. 15. mi. and right ascen. 2.2. houres, 40 minutes.

35  
in the knee of Sagitarius is a starre of the second bignes having south Declination, 42. deg. & right ascension 18. houres 44. minutes.

Starres neare about the north Pole, with their distance from the said Pole.

1  
The Pole starre is of the third bignes, whose distance from y Pole is 2. deg 52. m. & his right ascen. is 50. min.

2  
The foremost Guard of y second bignes, distant from y Pole 14. deg. 11. min. right ascension 14. hou. 54. minut.

3  
The hindermost Guard, of the second bignes, distant 16. degrees 42. minutes right ascension 15. houres 26. minutes.

September hath xxx. daies.

The Prime.			Leng. of the day.	Declination and true			
				☉ in m <sup>y</sup>		☉ in m <sup>y</sup>	
				H.M.	D.M	D.M	D.M
ii: 3.	1	F	Gale.	12 48	1 18 51	4 25	1 18 36
	2	G		12 44	2 19 49	4 2	2 19 35
9: x	3	A		12 40	3 20 48	3 40	3 20 33
i. xviii.	4	B		12 36	4 21 46	3 16	4 21 32
vii: 7	5	C	dog. d. e	12 32	5 22 45	2 53	5 22 30
	6	D		12 28	6 23 44	2 29	6 23 29
6: xv	7	E	Nat. El.	12 24	7 24 42	2 7	7 24 28
	8	F	Na. Ma	12 20	8 25 41	1 42	8 25 26
iiii	9	G		12 16	9 26 40	1 20	9 26 25
	10	A		12 12	10 27 39	0 57	10 27 24
i: xii:	11	B		12 8	11 28 38	0 33	11 28 23
8, i.	12	C		12 4	12 29 36	0 9	12 29 22
ix:	13	D		12 0	13 30 35	0 14	13 30 21
xvii, 8	14	E	Hol. cr.	11 56	14 31 34	0 38	14 31 19
	15	F		11 52	15 32 33	1 1	15 32 18
3. vi	16	G		11 48	16 33 32	1 25	16 33 17
	17	A	Lamb.	11 44	17 34 31	1 47	17 34 16
xiii.	18	B		11 40	18 35 30	2 12	18 35 15
	19	C		11 36	19 36 30	2 35	19 36 14
i, ili	20	D	Fast.	11 32	20 37 29	2 59	20 37 13
	21	E	Mathe.	11 28	21 38 28	3 22	21 38 13
xi	22	F		11 24	22 39 27	3 45	22 39 12
xix	23	G		11 20	23 40 26	4 8	23 40 11
viii. 7	24	A		11 16	24 41 26	4 32	24 41 10
xvi	25	B	Cipriā.	11 12	25 42 25	4 55	25 42 10
	26	C		11 8	26 43 24	5 18	26 43 9
7 v	27	D		11 4	27 44 24	5 41	27 44 8
	28	E	Fast.	11 0	28 45 23	6 4	28 45 8
xiii.	29	F	S. Mich	10 56	29 46 23	6 27	29 46 7
	30	G	Hierom	10 52	30 47 22	6 50	30 47 7



September.

of the Sunne.

☉ in my second yere

☉ in my third yere

D,M,	D,M	North Declination.	D,M	D,M
1	18 21		1	18 6
2	19 20		2	19 5
3	20 18		3	20 3
4	21 17		4	21 2
5	22 15		5	22 0
6	23 14		6	22 59
7	24 13		7	23 58
8	25 11		8	24 56
9	26 10		9	25 55
10	27 9		10	26 54
11	28 8		11	27 53
12	29 7		12	28 52
13	0 6		13	29 51
14	1 4		14	0 49
15	2 3		15	1 48
16	3 2		16	2 47
17	4 1		17	3 46
18	5 0		18	4 45
19	5 59		19	5 44
20	6 59		20	6 44
21	7 58		21	7 43
22	8 57		22	8 42
23	9 56		23	9 41
24	10 55		24	10 40
25	11 55		25	11 40
26	12 54		26	12 39
27	13 53		27	13 38
28	14 53		28	14 38
29	15 52		29	15 37
30	16 52		30	16 37

North Declination.

South Declination.

4

The end of the Dragons  
taile of the third bignes, dist.  
from the Pole 18. deg. 26. mi.  
nutes right ascen. 11. hour. 8,  
minutes.

5

The great Bears back of  
the second bignes, distant  
from the Pole 26. deg. 5. min-  
utes, right ascen. 10, houres  
40. minutes.

6

Cepheus right shoulder of  
the third bignes, distant 29,  
deg. right ascen. 21, hour, 10,  
minut.

7

The great Bears side of the  
second bignes, distant 31, de-  
g. 26. minut, right ascention 10,  
houres 38, minutes.

8

The first in her taile of the  
second bignes, distant 31,  
degrees 49, minutes right as-  
cention 12, houres 32, minut.

☾ 3 October

October hath 31. daies.

The Prim.			Len. of the day	Declination and true place.					
				☉ in ☐ Leape yere			☉ in ☐ First yere		
				H.M.	D.M.	D.M.	D.M.	D.M.	D.M.
8.iii:	1	A	10 48	1	18 22	7 13	1	18 6	7 7
x.i:	2	B	10 44	2	19 21	7 36	2	19 6	7 30
xviii:	3	C	10 40	3	20 21	7 58	3	20 5	7 52
	4	D	10 36	4	21 20	8 20	4	21 5	8 15
6.vii:	5	E	10 32	5	22 20	8 42	5	22 5	8 37
xv:7:	6	F Faith.	10 28	6	23 20	9 5	6	23 4	8 59
	7	G	10 24	7	24 20	9 27	7	24 4	9 21
	8	A	10 20	8	25 19	9 49	8	25 4	9 43
7.iii:	9	B Dennis	10 16	9	26 19	10 11	9	26 4	10 5
xii:10:	10	C	10 12	10	27 19	10 33	10	27 3	10 27
i:2:	11	D	10 8	11	28 19	10 54	11	28 3	10 48
ix,9,	12	E	10 4	12	29 19	11 16	12	29 3	11 10
	13	F Edward	10 0	13 om	19 11 36		13 om	3	11 31
4.xvii,	14	G	9 56	14	1 19	11 57	14	1 3	11 52
vi,11,	15	A	9 52	15	2 19	12 18	15	2 3	12 13
	16	B	9 48	16	3 19	12 39	16	3 3	12 34
xiii,5,	17	C Fast.	9 44	17	4 19	12 59	17	4 3	12 54
	18	D S.Luke:	9 40	18	5 19	13 19	18	5 3	13 14
	19	E	9 36	19	6 20	13 39	19	6 3	13 34
10,iii,	20	F	9 32	20	7 20	14 0	20	7 4	13 54
xi,2	21	G	9 28	21	8 20	14 20	21	8 4	14 14
xix,9.	22	A	9 24	22	9 20	14 39	22	9 4	14 33
	23	B	9 20	23	10 20	14 58	23	10 4	14 52
7.viii,	24	C	9 17	24	11 21	15 17	24	11 4	15 11
8,xvi.	25	D Crispin	9 14	25	12 21	15 35	25	12 5	15 29
v.11.	26	E	9 10	26	13 21	15 52	26	13 5	15 48
	27	F Fast,	9 7	27	14 21	16 12	27	14 5	16 6
xiii,5	28	G Simon	9 4	28	15 22	16 30	28	15 6	16 25
	29	A & Jude	9 6	29	16 22	16 46	29	16 6	16 42
ii,3,	30	B	8 56	30	17 23	17 4	30	17 7	16 59
x,11,	31	C	8 52	31	18 23	17 21	31	18 7	17 16

South Declination.

## of the Sunne.

☉ in  $\triangle$  second yere☉ in  $\triangle$  third yere.

D.M. D.M.

D.M. D.M.

1	17	51	7	2
2	18	51	7	25
3	19	50	7	47
4	20	50	8	9
5	21	50	8	32
6	22	49	8	53
7	23	49	9	16
8	24	49	9	38
9	25	49	10	0
10	26	48	10	22
11	27	48	10	43
12	28	48	11	4
13	29	48	11	26
14	on	48	11	47
15	1	48	12	8
16	2	48	12	29
17	3	48	12	50
18	4	48	13	10
19	5	48	13	30
20	6	49	13	50
21	7	49	14	10
22	8	49	14	29
23	9	49	14	48
24	10	49	15	6
25	11	50	15	25
26	12	50	15	43
27	13	50	16	2
28	14	51	16	20
29	15	51	16	38
30	16	52	16	55
31	17	52	17	12

South Declination.

1	17	36	6	56
2	18	36	7	19
3	19	35	7	41
4	20	35	8	3
5	21	35	8	26
6	22	34	8	48
7	23	34	9	10
8	24	34	9	32
9	25	34	9	54
10	26	33	10	16
11	27	33	10	38
12	28	33	10	59
13	29	33	11	20
14	on	33	11	41
15	1	33	12	2
16	2	33	12	23
17	3	33	12	44
18	4	33	13	4
19	5	33	13	24
20	6	33	13	44
21	7	34	14	4
22	8	34	14	24
23	9	34	14	44
24	10	34	15	2
25	11	35	15	20
26	12	35	15	38
27	13	35	15	57
28	14	36	16	15
29	15	36	16	33
30	16	37	16	50
31	17	37	17	7

At the knees of Cassiopeia, is a starre of the third bignes, distant from the Pole 31: degrees 5: minutes, right ascention 1: hou.

10

In her hippe is a starre of the third bignes, distant 31: degrees 26: minutes, right ascention 32: minutes.

11

The backe of her chaire of the third bignes, distant 33: degrees 2: minutes, right ascention 23: houres 48: minutes.

12

The great Beares thigh of the second bignes, distant from the Pole 34: degrees 3: minutes, right ascention 11: houres 32: minutes.

November



Nouember hath 30. daies.

The Prime.			Leng. of the day.	Declination and true place.			
				☉ in the Leape year.		☉ in the First yere	
				H.M.	D.M.	D.M.	D.M.
	1	D	All Sain	8 49	19 22	17 37	19 7
5, xviii	2	E		8 46	20 23	17 53	17 49
vii, 8	3	F		8 43	21 23	18 9	18 5
	4	G		8 40	22 24	18 25	18 21
xv,	5	A	K. pref.	8 37	23 25	18 40	18 36
	6	B	Leonar.	8 34	24 25	18 55	18 31
iiii, 10,	7	C		8 31	25 26	19 10	19 6
	8	D		8 28	26 27	19 24	19 20
xii, 1,	9	E		8 25	27 27	19 38	19 35
9, i	10	F		8 22	28 28	19 52	19 49
6, ix	11	G	S. Marti	8 19	29 29	20 5	20 2
	12	A		8 16	30 30	20 18	20 15
xvii:	13	B		8 13	31 31	20 31	20 28
vi, 5:	14	C		8 10	32 32	20 43	20 40
	15	D		8 7	33 33	20 55	20 52
xiii,	16	E		8 4	34 34	21 6	21 3
	17	F		8 2	35 35	21 17	21 14
iii, 3,	18	G		8 0	36 36	21 28	21 25
	19	A		7 57	37 37	21 38	21 35
i, xi	20	B	Edmon	7 54	38 38	21 48	21 45
4, xix,	21	C		7 51	39 39	21 57	21 54
viii, 6,	22	D	Cicily.	7 49	40 40	22 6	22 3
xvi, 10,	23	E	Clemēt	7 47	41 41	22 14	22 11
	24	F		7 45	42 42	22 22	22 20
v, 5,	25	G	Katheri	7 43	43 43	22 30	22 28
	26	A		7 40	44 44	22 37	22 35
i, xiii,	27	B		7 38	45 45	22 44	22 42
	28	C		7 37	46 46	22 51	22 49
ii,	29	D	Fast.	7 36	47 47	22 57	22 55
	30	E	Andre	7 35	48 48	23 2	23 0

South Declination

Nouember.  
of the Sunne.

☉ in the second			☉ in the third yer.		
	D.M	D.M		D.M	D.M
1	18 52	17 29	1	18 37	17 24
2	19 52	17 45	2	19 37	17 41
3	20 53	18 1	3	20 38	17 57
4	21 53	18 17	4	21 38	18 13
5	22 54	18 33	5	22 39	18 29
6	23 54	18 47	6	23 39	18 44
7	24 55	19 2	7	24 40	18 59
8	25 56	19 17	8	25 41	19 14
9	26 57	19 31	9	26 42	19 28
10	27 57	19 45	10	27 42	19 42
11	28 58	19 59	11	28 43	19 56
12	29 59	20 12	12	29 44	20 9
13	1 0	20 25	13	0 45	20 22
14	2 1	20 37	14	1 46	20 34
15	3 2	20 49	15	2 47	20 46
16	4 3	21 0	16	3 48	20 58
17	5 3	21 11	17	4 48	21 9
18	6 4	21 22	18	5 49	21 20
19	7 5	21 33	19	6 50	21 30
20	8 6	21 43	20	7 51	21 40
21	9 7	21 52	21	8 52	21 50
22	10 8	22 1	22	9 53	21 59
23	11 9	22 10	23	10 54	22 8
24	12 10	22 18	24	11 55	22 17
25	13 11	22 26	25	12 56	22 25
26	14 12	22 33	26	13 57	22 32
27	15 14	22 40	27	14 59	22 39
28	16 15	22 47	28	16 0	22 46
29	17 16	22 52	29	17 1	22 52
30	18 17	22 58	30	18 2	22 57

South Declination



Certaine Starres neere  
vnto the South Pole, with  
their distance from the said  
Pole, and right ascen-  
tion.

1

The southermost starre in  
the south triangle, is a starre  
of the third bignes, distant  
from the south Pole, 11. de-  
grees 30 minutes right ascen-  
tion 9. houres.

2

The southermost of the  
Croliers, is a starre of the  
second bignes, distant 17:  
degrees 30:minutes right as-  
cention 12:minutes.

3

In the North west angle of  
the south triangle, is a starre  
of the second bignes, distant  
from the Pole, 27:degrees  
25:minutes right ascention 8:  
houres 4:minutes.

December

December hath 31 daies.

The Prime.			Leng. of the day.	Declination and true place.					
				☉ in 7 Leape yere			☉ in 7 Fift yere.		
				H, M,	D, M,	D, M,	D, M,	D, M,	D, M,
xviii, 9,	1	F	7 34	1 19	48	23 6	1 19	33	23 5
	2	G	7 33	2 20	49	23 10	2 20	34	23 9
vii,	3	A	7 32	3 21	51	23 15	3 21	35	23 14
	4	B	7 31	4 22	52	23 19	4 22	37	23 17
6, xv,	5	C	7 30	5 23	53	23 22	5 23	38	23 21
	6	D	7 30	6 24	54	23 24	6 24	39	23 23
iiii, 2,	7	E	7 30	7 25	55	23 26	7 25	40	23 25
	8	F	7 30	8 26	57	23 28	8 26	41	23 27
10, xii, 11	9	G	7 30	9 27	58	23 29	9 27	43	23 29
ix, 6,	10	A	7 30	10 28	59	23 30	10 28	44	23 30
	11	B	7 30	11 0	0	23 30	11 0	45	23 30
xvii, 5,	12	C	7 30	12 1	1	23 30	12 0	46	23 30
	13	D	7 30	13 2	2	23 29	13 1	47	23 29
vi,	14	E	7 31	14 3	4	23 28	14 2	49	23 28
	15	F	7 32	15 4	5	23 26	15 3	50	23 26
5, xiii.	16	G	7 33	16 5	6	23 24	16 4	51	23 24
	17	A	7 34	17 6	7	23 22	17 5	52	23 22
8, iii:	18	B	7 35	18 7	8	23 19	18 6	54	23 19
xi:	19	C	7 36	19 8	10	23 15	19 7	55	23 15
xix: 8:	20	D	7 37	20 9	11	23 11	20 8	56	23 11
	21	E	7 38	21 10	13	23 6	21 9	57	23 7
3: viii:	22	F	7 39	22 11	14	23 2	22 10	58	23 2
xvi. 6,	23	G	7 40	23 12	15	22 56	23 11	59	22 57
	24	A	7 41	24 13	16	22 50	24 13	1	22 52
v.	25	B	7 42	25 14	18	22 44	25 14	2	22 46
	26	C	7 43	26 15	19	22 37	26 15	4	22 39
10. xii.	27	D	7 44	27 16	20	22 30	27 16	5	22 32
ii.	28	E	7 46	28 17	21	22 23	28 17	6	22 24
x. 7.	29	F	7 48	29 18	22	22 14	29 18	7	22 16
	30	G	7 49	30 19	24	22 6	30 19	8	22 8
	31	A	7 50	31 20	25	21 57	31 20	10	21 59

South Declination.



## of the Sunne

☉ in 7 second yere

☉ in 7 third yere

D.M. D.M

D,M, D,M,

1	19	18	23	4
1	20	19	23	8
3	21	20	23	13
4	22	21	23	16
5	23	22	23	20
6	24	23	23	23
7	25	24	23	25
8	26	26	23	27
9	27	27	23	29
10	28	29	23	30
11	29	30	23	30
12	☉	3	23	30
13	1	32	23	30
14	2	34	23	29
15	3	35	23	27
16	4	36	23	25
17	5	37	23	23
18	6	39	23	20
19	7	40	23	17
20	8	41	23	13
21	9	42	23	9
22	10	44	23	4
23	11	45	22	59
24	12	46	22	53
25	13	47	22	48
26	14	49	22	41
27	15	50	22	33
28	16	51	22	26
29	17	52	22	19
30	18	53	22	10
31	19	55	22	1

South Declination.

1	19	2	23	3
2	20	3	23	7
3	21	4	23	12
4	22	6	23	15
5	23	7	23	19
6	24	8	23	22
7	25	9	23	24
8	26	10	23	26
9	27	12	23	28
10	28	13	23	29
11	29	14	23	30
12	☉	15	23	30
13	1	16	23	30
14	2	18	23	29
15	3	19	23	28
16	4	20	23	26
17	5	21	23	24
18	6	23	23	21
19	7	24	23	18
20	8	25	23	14
21	9	26	23	10
22	10	28	23	5
23	11	29	23	0
24	12	30	22	54
25	13	31	22	49
26	14	33	22	43
27	15	34	22	35
28	16	35	22	28
29	17	36	22	21
30	18	37	22	12
31	19	39	22	4

The fore foote of the Centaur of the second bignes, distant 29: deg. 54: minutes, right ascension 14: heures 44: minutes.

5  
Centaurus thigh of the second bignes, distant 40. degrees 30. minutes, right ascension 11. hour. 52. minutes.

6  
Canopus in argo navis of the first bignes, distant from the south Pole 38: degrees 10: minutes, right ascension 6: heures 16. minutes.

7  
The last of Eridamis of the first bignes, distant 50: degrees right ascension 3: heures.

How to vse these Starres, for the time of their being vpon the Meridian, and consequently to finde the high of the Pole or latitude, by them followes after ward.

This Table

# The Seamans Kalender.

	γ		8		II	
	=		m		7	
	D,M	DM	D,M	DM	D,M	DM
0	0	0	11	30	20	12 30
1	0	24	11	51	20	25 29
2	0	48	12	12	20	37 28
3	1	12	12	33	20	49 27
4	1	35	12	53	21	0 26
5	2	0	13	13	21	11 25
6	2	23	13	33	21	22 24
7	2	47	13	53	21	32 23
8	3	11	14	13	21	42 22
9	3	35	14	32	21	51 21
10	3	58	14	51	22	0 20
11	4	22	15	10	22	9 19
12	4	45	15	28	22	17 18
13	5	9	15	47	22	25 17
14	5	32	16	5	22	32 16
15	5	55	16	23	22	39 15
16	6	19	16	40	22	46 14
17	6	42	16	57	22	52 13
18	7	5	17	14	22	57 12
19	7	28	17	31	23	3 11
20	7	50	17	47	23	7 10
21	8	13	18	3	23	12 9
22	8	35	18	19	23	15 8
23	8	58	18	34	23	19 7
24	9	20	18	49	23	22 6
25	9	42	19	4	23	24 5
26	10	4	19	18	23	26 4
27	10	26	19	32	23	28 3
28	10	47	19	46	23	29 2
29	11	9	19	59	23	30 1
30	11	30	20	12	23	30 0
	☿	♊	♋	♌	♍	♎
	♏	♐	♑	♒	♓	♈

This Table sheweth the Declination of the Sun, upon euerie several degree. of the Eclipticke, through all the foure quarters of the Zodiac: by which Table you may make trial of the former Table of Declination, if you doubt of any part thereof, as followeth:

First, by the Kalender or Ephemerides, next before, finde out the day of the month for which you desire the Declination, & right against the same you shall haue the signe, degree & minute, which the Sun possesseth in the Zodiacke the day aforesaid, with which signe and degree, enter this Table and marke whether your signe bee at the head of the Table, or at the foote thereof: for if the signe bee in the head, then you must count the degree thereof downward, in the first Column at the left hand the Table: but if the signe bee at the foote of the Table, you must count the degree thereof upward, in the first Column on the right hand: and in the common angle, where the Characters of the signe and the deg. thereof meetes is the deg. & min. of declination desired.

Example.

The . of July 1608. the place of the Sunne is 23. deg. of Can. I finde Canc in the foote of this Table, therefore counting 23. degrees thereof upward

## The Sea-mans Kalender.

ward in the first Columnne on the right hand, right against 23, in the columnne where Canc. stands, is 21. degr. 32. min. which is the declination of 23. deg. of Canc. of the Sun, being in so many deg of the same signe. But if the place of the sunne haue odde minutes therewith, you must take the difference betwixt the 2. uerest degr. of declination, and worke by the proportionall partes of 60. minut. to a degree, as for example. The 22. of Aug, 1609, the true place of the Sun is 8. degr. 52. min. of Virgo, I finde Virgo to bee in the foote of this Table, therefore in the first columnne on the right hand, I count vpwards 8. degrees, and right against the same in the columnne where the charact of Virgo is, I finde 8. degrees 35. minutes, which is the Declination of 8. degrees of Virgo: but now there is the Declination of 52. minu. to bee either added or deducted as the Declination doth increase or decrease. To finde which, I take the difference betwixt 8. degrees 35. minutes, the Declination of 8. degr. of Virgo, and 8: 13: minutes, the declination of 9. degrees of Virgo, which is 22. minutes. Then I say, if 60. minu. giue 22. minutes, what giues 52. min. facit, 19: minutes 4: seconds, but omitting the seconds, because the declination doth decrease, I deduct 19. minutes from 8. 35. minutes, and the remainder is 8. 16 minutes for the true declination of 8 degrees 52: minutes of Virgo.

Again, the 16. of Aprill, 1610, the true place of the Sun is 5: 54 minutes of Taurus, I finde Taurus in the head of the Table, then counting 5. degrees downeward in the first columnne on the left hand, right against the same vnder Taurus is 13, 13 minutes for the declination of 5: degrees of Taurus: then for the 54 minutes, I take the difference betwixt 13: 13: minutes, and 13: 33: min. giue the declination of 6. degrees of Taurus, which is 20. mi., then if 60 20. what giues 54? facit: 18. min. which 18. mi. I adde to 13: 13: minutes, because the Declination doth increase, and it makes 13: 31 minutes for the true Declination of 5: 54: minutes of Taurus: these three examples (to the ingenious) are as good as five hundred.

The



*The diuision, partes, order, and explanati-  
on of the former Almanacke or  
Ephemerides.*

**T**He first Page of the said Ephemerides containes an Almanacke for 24. yeares to come, shewing the Prime, Epacte, Sunday letter, Leape yeare, with all the principall inuouable Feastes in the whole yere. Next followes the 12. monthes of the yeare in order, each month containing two faces, which 2. faces may be diuided into 3. principall sections, the first common, the second and third Astronomickall: the first being indeede the commune, because it is most needfull for all persons, consisteth of syue columes or spaces the first space whereof sheweth the day & houee of the Moones change for 19. yeares to come: & second sheweth the number of the daies in euerie month: the third, the Letters or dinarie for euerie day of the weeke: the fourth, the holye daies and other daies of note in each month: Where note, that those that are obserued for holye daies haue this word Fast, before them, & the fift and last of the said first section, sheweth the length of the day in houres and min. where the Pole is eleuated 51. Degrees 40. minutes.

The second section containeth 4. principal partes, each part consisting of 3. columes, the 4. partes being 4. seueral yeres, each first yeare being Leape yeare, therein comprising the varietie of the Sunnes Course through the Zodiacke in the said 4. yeares. And the 3. spaces or Columes in each yere, the first is the dates of each month in the said yere, the second the true place of the Sun answerable thereto, the third, the Declination or distance of the Sun from the Equin. pointes of Aries & Libra, toward the tropicall points of Cancer and Capricorne answerable to each day of the month, and to the degree and min. of the sunne in the Zodiacke.

The

## The Sea-mans Kalender.

The reason wherefore the said Table is made for 4. yeares & neither more nor lesse, is because that euerie yere is not of like equalitie of daies one with another, for the first yere hath 365. da. and neere 6. houres, the second and third yeares being so likewise, but in y<sup>e</sup> fourth yere, the odd houres are vnited together, which being 4 times 6. is 24. houres verie neare, making a naturall day, which day is added to y<sup>e</sup> said fourth yere, whereby the said fourth yere is called leape yere, because it hath one day more then his fellows.

And so this Table being made for 4. yeares, would serue for a long time, were it not that the said fourth yere is not iust 366. daies but wants 20. mi. 02. of an houre, for if there were a iust equalitie made of the dayes of the yeares, with the progresse of the sunne through the Zodiacke, then this table would serue a long time without correction: but onely the Zodiacke, with the whole eyght sphere hath a certaine retrograde motion or going backward, yet so vn sensible, that these Tables being gathered & calculated out of y<sup>e</sup> best & truest Ephemer. for the yeres 1608, 1609. 1610, 1611. according to y<sup>e</sup> true place and dayly motion of the sun there exactly gathered, I make no question, but that they will verie well serue for 20. yeares at the least, the difference of the Suns place euerie 5. yere is so small being not much about 30. seconds or halfe a minute, which in 20. yeres being 5. Bissextiles or leape yeares, makes 2. min. 30. seconds: a small matter to make any difference in the Suns declination.

Not withstanding which small error that can growe in so long a time, I thinke it not a misse for the satisfiing of those ingenious spirits, which desire perfection in their worke, to adde this one rule for their further satisfaction, that after these 4. yeares are past, for which the said former Tables are exactly and truly calculated, to knowe precisely the true place of the Sunne, for any other 4. yeares, after ward doe thus: substract the 1611. from the date of the yere in which you would knowe the true place of the Sunne, y<sup>e</sup> remainder whereof diuided by 4. that which remaines vpon the said diuision, shewes which of the 4. yeeres in the former Kalender serueth to shew the Suns place for the  
yeate

## The Seamans Kalender.

yeare proposed, and if nothing remaine after the Division, then the last of the yerres being the fourth in number, is your yeare desired: which knowne to make an equation of the Sunnes true place, marke how many Unities are in your quotient, for so many min. must be added to the Suns place in the said yere formerly found for euerie day in the monthes of May, June, July, August, September, & October, and halfe so many minuts in the other monthes.

### As for Example.

I would knowe the true place of the Sunne the 15: of August, in the yeare 1624. first I substract 1611: from 1624, and there restes 13, which deuided by 4: brings 3: in the quotient, and 1, remaines, which shewes that the first of the 4: yeares, answers to the yeare desired, and beeing that there is 3, in the quotient, therefore I must adde 3: minutes to the place of the Sunne, which is belonging to the day and yere aforesaide, which, being that to the 15: of August in the first of the yeares belongs 2. degrees 21: minutes of Virgo, I adde three minutes thereto, and the whole 2. 24: minutes is the true place of the Sunne for the day and yeare aforesaide, whose declination answerable thereto, you shal finde right against the same in the next colunne towards the right hand, to bee 10: degrees 39. minutes.

Againe, the 15 of March, in the yeare 1625: I desire the true place of the Sunne, therfore substracting 1611: from 1625 restes 14: which deuided by foure, the quotient is 3, and the remainder is 2: which remainder being 2: I must seeke for the Sunnes place in the second of the 4 yeares, or the first after the Leap yere, whose place there I finde for the 15 of March, to be 4 degr. 51: min. of Aries: to which, because the quotient is 3, I adde halfe so many minutes, which being 1: minnte 30: seconds makes 4: degrees 52 minutes and 30: seconds for the Suns true place, the 15: of March 1625 whose declination answerable therto you shall finde right against the same in the next colunne towards the right hand, to be 1: degree 57: minutes northerly: Wherein thus much is to be noted, y<sup>e</sup> albeit, that in the true place of the sun there may bee in that



## The Seamans Kalender.

that time so much difference, yet in the Declination thereof, there can be no sensible difference, for wee see, that 3. minutes more or lesse in the true place of the Sunne, doth not produce 'aboue a minute difference of Declination, when the Sunnes Declination is swiftest, which is neare vnto the Equinotiall point, and beeing neare vnto the Tropicks, when the Declination dooth increase or decrease verie slowly three or foure minutes difference in the Sunnes true place, doth not make any difference in the Declination at all: And therefore by that reason may you bee well assured, y<sup>e</sup> these Tables being exactly calculated for the yerres aforesaid, wil serue you for a verie long time without any sensible error.

The third section being the last of the second face, containeth the Names, Magnitudes, and Declinations of 54. notable fixed Starres with their right ascension in houres and minutes, mooste coummodious to finde the elevation of the Pole, whose vse followeth afterward.

## Propositions to bee wrought by the Ephemerides or Seamans Kalender, as followeth.

To knowe the Moones change.

**T**O knowe the day and houre of Coniunction or Change of the Moone, first looke in the first Page of this Ephemerides, right against the yeare of our Lord, for the Prime Number, seruing to that yeare: which number keeping in memorie, turne to the month in which you desire the Change of the Moone, and in the first Column of the said Month vnder the Title Prime look for the Prime number which you kept in memorie, which Prime numbers are there all in numerall Letters, and right against the saide Prime number in the next Collume, is the number of the day of the month, on which the Moone changes: and if

if

there

## The Sea mans-Kalender.

there be any figure with the Prime number, marke whether it be before or after the said Prime number, for if it be before, it sheweth the Moone to change so many houres before Noone, if after, it sheweth so many houres after noone: but if there be no figures at all with the Prime number, then the Moone changes iust at noone.

### As for Example.

In the yeare 1610. I would know in June vpon what day & houre of the said Month the Moone changes. In the first Page being an Almanacke of 24. yeares for the Prime, Epact, Dominical Letter and moouable Feastes, I finde the Prime for that yeare to be 15. which keeping in memorie, I turne to June, and in the first Colu[m]ne therof vnder the title Prime, among the numeral Letters I seeke for 15. which I finde right against the 11. day of the Month thus 9.xv. with the figure of 9. before it, which sheweth that in June 1610. the Moone changes the 11. day, 9. houres before Noone.

Againe in August the same yere, the Prime 15. vnder the title Prime in the Month of Aug. I finde the Prime aforesaid right against the 8. day of the Month, with the figure 7. after it, and further against it in the third Colu[m]ne, among the Letters for the daies of the weeke, is the Letter D. which by reason that G. is the Dominicall Letter or Sunday letter for that yere, C. stands for Wednesday: so then I conclude, that in August. 1610. the Moone shall change the 8. day being wednesday 7. houres after noone.

### Of the full and quarters of the Moone.

2 The next thing to be considered heerein, is the first quarter, the full Moone, and the last quarter thereof, which is thus done: to the time of her change add 7. daies and 6. houres, sheweth the first quarter, that doubled shewes the opposition or full: and there to againe the said 7. daies, 6. houres added, makes the time of the last quarter.

To

## The Sea-mans Kalender.

To know what signe the Moone is in.

3. A third thing needefull to bee known, is in what signe the Moone is at all times which may thus be done: vpon the change day next before your day required, looke in the second section of the Ephe. vnder the yeare desired, and the Columne of the place of the Sunne for y<sup>e</sup> day and yeare, what signe and degree thereof the Sunne was in vpon the said day of the Coniunction, for then were the Sunne and Moone both in one signe and degree: and to know what signe she is in any day after, multiply her age by 12. which is the meane motion of the Moone: & fro the day of the Coniunction, in the Columne of the true place of the Sunne, tell forward, if the number be so great, out of that Month to the next, till you haue tolde the Number of the product of the Moones age, multiplied by 12. and where the said product Number ends, is the signe and degree of the Moone.

### Example.

The 5. of October 1605. I desire the same: in which month by the first proposition, I finde the Moone to change the second day at one a clocke after noone: then in the first part of the second section shewing the true place and Declination of the Sunne for the said yeare, in the first Columne thereof I seeke the said second day of the month, & right against it in y<sup>e</sup> next columne is 18. 51. mi. of Li. in which signe & deg. both the Sun and Moone were at the Coniunction: then counting from the change to the 5. day is three daies for the Moones age, that multiply by 12. is 36. which counting from the day of the Coniunctio along in the Columne of the Suns place, endes vpon the 6. day of the next month being Nouember, against which day is 23. degrees 52. minutes of Scorp. therfore I conclude the Moone to be in 23. degrees of Scorpio. the day, month and yeare aforesaid: otherwise if you multiplie the Moones age by 2. and diuide the product by 5. the quotient shewes the whole signe, and the remainder so many times 6. degrees as the Moone is gone from that place of the Zodiacke where shee was in the Coniunction.



## The Sea-mans Kalender.

The Moones coming to the Meridian, with the time of her rising and setting.

4 Multiplie the Moones age by 12. and deuide the product by 15. the quotient sheweth the houre of the Moons being south, and if any thing remaine after the deuision, for euerie unitie that remaines adde 4. min. because 15. degrees make an houre of time, & 4. min. a degree. What known, learn by the third proposition what signe the moone is in, and then looke out in the second section what time and day of the yeare the Sunne possesseth the same signe and degree thereof, and right against the saide day in the last Columnne of the first section, under the title length of the day, is the length of the day, the sunne being in the same signe in houres and minut. halfe that number of the daies length taken from the time of the moones being south: sheweth her rising, and the saide halfe added to the time of her being south, sheweth her setting.

Example.

The 13. of October 1605. by the first proposition, I finde the Moone to change that month, the 2. day after noone, and the number of daies betwixt that and the 13. aforesaid is 11. for the moones age: therefore multiplying 11. (her age) by 12. her meanes motion, the product is 132. which deuided by 15. (the degrees answering to an houre) the quotient is 8. houres, and 12 remaines. which is so many times 4. min. so I conclude the Moone to be vpon the Meridian the day aforesaid, at 8. of the clocke and 48. mi. Then by the third proposition, I finde the Moone to be that day in about 30. degrees of Pisces: the Sunne being in which place, is about the Horizon 10. houres and some odde minutes: which 10. houres is likewise the time of the Moones continuance about the Horizon at that time, or at any time being of the like age, and in the same Signe: therefore taking halfe 10. houres, which is 5. houres from 8. a clocke 48. minutes, the time of the Moones being south, there restes three houres 48. minutes for the time of her rising. Likewise adding five houres to eight houres, 48. minutes, maketh 13. houres 48. min. from which taking away 12. houres, because the artificiall day consistes but of 12. houres, there restes 1. houre 48. min.

## The Seamans Kalender.

min. after midnight, for the time of her setting. Thus you see that the day and yeare aforesaid, the Moone shall here in our Horizon rise at 3. a clocke 48 min. after noone: shee shall bee south or vppon the Meridian at 8. a clocke 48. minutes at night, shee shall set at one a clocke 48. minutes morning. and her continuance about the Horizon, or her shining to vs is 10. houres.

This is a verie necessarie thing to be knowne, for by her being vpon any other point of the compasse, you may giue a verie neere gesse at euerie houre of the night.

The next thing to be considered in the first section is, the Feastiuall daies, and other daies of note, which are so common, that they neede no explanation, onely this: befoze euerie feast which is kept holy day, is set this word Fast.

To knowe the length of the day, or the length of the night, with the rising and setting of the Sunne.

5 All this is performed by the last Columnne of the first section, thus: right against the day of the month desired in the last Columnne of the saide first section, vnder the title length of the day, is the length of the day desired, in houres and minutes, which number subtracted from 24. the length of a naturall day, leaues the length of the night: and halfe the saide number taken from noone, leaues the houre of the Suns rising: the other halfe of the day added to noone, sheweth the sunne setting.

Example.

The 20. of October this present yeare 1605. vnder the title length of the day, right against the said 20. day, is 9. houres 36. minutes, the length of the day: which 9. houres 36. minutes taken from 24. houres, leaues 14. houres 24. minutes for the length of the night. Then the halfe of 9. houres 36. minutes which is 4. houres 48. min. taken from noone, leaues 7. houres 12. minutes for the sunne rising. The same 4. houres 48. minutes added to noone, makes 16. houres 48. minutes, which is 4. houres 48. minutes after noone by which you see that the 20. of October the length of the day is 9. houres 36. minutes, the length of the night 14. houres 24. minutes: the sunne riseth 12. minutes after 7. in the morning, and setteth 48

## The Sea-mans Kalender.

minutes after 4. in the evening.

Thus much for the first section: the 2. section being foure parts, seruing for foure seuerall yeares, euerie part having 3. columnes the first the day of the month, the 2. the true place of the Sun: and the 3. the declination of the Sunne agreeing thereto: all the three partes being of like qualitie, which are so plaine and so commonlye knowne, that they neede no further distinction: albeit that the vses thereof are manifold, and the commodities excellent: for there are few propositions concerning the Spheare, which can bee wrought without the true place of the Sunne knowne, and being so much vse for it, there are as few meanes for the true knowledge thereof, but onely by the Ephemer, which euerie one cannot haue.

And for that cause I haue transferred the true place of the Sun in deg. and mi. out of Martin Euerarties Ephemerid. into this former Kalender, where it is ready for such as desire the same, or as haue occasion to vse the same, in working conclusions, or making of instruments Mathematical: but most chiefly I haue heere placed it, to the end that those that stand in doubt of the truth of these Tables of the Sunnes declination, may at their owne pleasure make triall thereof: the order how to doe the same, is set downe in the first printed page after the saide Tables, for by the true place of the Sunne, is found his Declinaion either North or South, and by his Declination, and obseruation of the Sunnes Altitude vpon the Meridian, is knowne the height of the Pole or Latitude of the place where you are.

How to vse the Sunnes Declination, thereby to finde out the Equaion of the Pole.

5 To finde out the Altitude or height of the Poles, in any seuerall Latitude, viz. How much the Pole is raised aboue your Horizon in degrees and minutes, it is necessarie first to take by obseruation, the Meridian Altitude of the Sunne: which Meridian Altitude is known by taking the height of the Sunne, that day in which you would obserue, iust at noone: at which time the sunne is highest. beeing then also vpon the Meridian: which  
found,



## The Sea-mans Kalender.

found, note it downe in paper or slate: then knowing the yeare of our Lord, with the Month in which you are, and also the day of the Month, Look in the Kalender before spoken off, for the month and day thereof, and right against the saide day of the month, toward the right hand, vnder the title Declination of the Sunne, you shall see the seuerall yeares, which the saide Tables of Declination serue for. If it bee Leape yeare, looke in the first of the saide four Tables vnder the title, Leape yeare: If it be the first yeare after the Leape yeare, then resort to the second of the saide Tables, vnder the title first, and so of the second and third, and after those four yeares are past, come backe againe to the first, and proceede as you did before: then (as I said) hauing found out the month, day and yeare, direct your eye downeward toward the foote of the Table, in that Table which serues to the yeare proposed, till you finde a number making a right angle, with the day of your month: or more plainly, looke what number in the last Columnne of your yeare is right against the day of your month, which numbers are the declination for the day desired: and being two numbers in the said colum, the first are degrees, the other minutes: then regard also whether the Sun hath North declination or South declination, which is set downe betweene the seuerall spaces: where, by the way you shall note, that from the Sunnes entrance into Aries, which is the 11. of March, til his entrance into Lib, the 13. of September, he hath North Declination, & from the saide 13. of September till his entrance into Aries again, South Declination, the saide declination increasing according to the Sunnes progression through the signes from his entrance into Aries, till his entrance into Cancer: and decreasing fro Cancer to the beginning of Libra. Then againe increasing from Libra to Capricorne, and decreasing from Cap. to the end of Pisces, and beginning of Aries. Aries, Taurus, Gemini, Cancer, Leo, & Virgo, being signes, hauing North declination from the Equinodiall Circle, & Libra, Scorp. Sagitarius, Capricornus, Aquarius and Pisces south signes, hauing South declination from the said circle: then knowing (as I haue saide) the Meridian Altitude of the Sunne, the declination of the Sun, and whether the Sunne hath north or south Declination: as

## The Seamans Kalender.

these three things are alwaies to be considered, in knowing the height of the Pole. If the Declination be north, subtract the Declination from the Meridian Altitude, the remainder is the elevation of the intersection, or cutting of the Equinoctiall with the Meridian above the Horizon which in common termes is the elevation of the Equinoctiall above the Horizon: which height of the Equinoctiall, taken from 90. leaueth the height of the Pole, or the latitude of the place of your obseruation. But contrariwise, if the Sunne hath South Declination, adde the saide Declination to the Meridian Altitude, the product is the height of the Equinoctiall, which likewise taken from 90. leaueth also the height of the Pole.

### Example.

I obserued the 11, of July 1608. in the Cittie of London, and found the Meridian Altitude of the Sunne to be 58. degrees 48. minutes, and the Declination of the Sunne north 20. degrees, 28. minutes, Being that the Declination was north, I subtracted 20. degrees 28. minut. the Declination of the Sunne from 58. degrees 48. minutes, the height of the Sunne at noone: the remainder was 38. degrees 20. minutes, the height of the Equinoctiall: that taken from 90. leaues 51. degrees 40. minutes, for the height of the Pole or Latitude of London.

This rule is to be understood, when you are between the Equinoctiall and the North Pole, and the Sunne to the southward of you: but if you should be betwene the Equinoctiall & the South Pole and the Sunne North from you: then you must worke contrarie, for then if the Sunne hath South Declination, you must subtract the Declination from the Meridian Altitude, and if the Sunne hath North Declination, you must adde the saide declination the Meridian Altitude.

### For Example.

Being at Sea to the Southwards of the Line, the fourth of Januarie. 1608. suppose that you obserue the height of the Sunne at noone, and finde it to be 66. degrees 20. minutes, then you shall finde the Declination to be 21. degrees 25. minutes to the southwards, which subtracted from 66. degrees 20. minutes, the

## The Sea-mans Kalender.

the Meridian Altitude leaues 44. degrees 55. minutes for the height of the Equinoctiall: that taken from 90. restes 45. degrees 5 minutes for the height of the South Pole about the Horizon.

Againe, suppose that being at Sea the 10. of May, 1608. and obseruing the Sunne, you take his Altitude at noone 60. degrees 30. mi. & his declination then is 20. deg. 6. mi. northward, but then not hauing obserued long before, you knowe not whether you are to the Northward of the Equinoctiall, or to the Southward of the said line: to know which, set the Sunne by your compasse, and marke which way the shadowe of the Sunne striketh: for if hee casteth his shadowe the same way that his Declination is, then is the Sunne betwixt the Equinoctiall and you. Your selfe being also the same way that the Sunnes declination is: and therefore subtracting the Declination 20. degrees 6. min. from 60. degrees 30. minu. the Meridian Altitude restes 40. deg. 24. mi. the height of the Equinoctiall: the complement whereof 49. degrees 36. min. is the Elevation of the North Pole: but if the Sunne castes his shadow contrarie to his Declination, that is to say: if hauing north Declination, his shadowe goeth southward, or hauing south Declination, castes his shadowe northward: then either the Equinoctiall shall be betwixt you and the Sunne, or you in the Equinoctiall, or else you shall be betwixt the Equinoctiall and the Sun: which to knowe, adde the declination and the Meridian Altitude for the day proposed together, if the summe of the addition be lesse then 90. degrees, so much as it wanteth of 90. degrees, shall you be distant from the Equinoctiall, that way which the shadow striketh: if it be iust 90. degrees then are you vnder the Equinoctiall. Againe, if your said Meridian Altitude and Declination added, passeth 90. degrees, then so much as is the ouer-plus shall you bee from the Equinoctiall towards the Sunne, and then also you shall be betwixt the Equinoctiall & the Sun: and if you finde the Sun to be in your Zenith so much as is the Declination shall you bee from the Equinoctiall, that way that the sunne Declineth: by which reason, if the sunne be in your Zenith, that is 90. degrees high, and hath no declination, then are you vnder the Equinoctiall.



## The Sea-mans Kalender.

How to appropriate the Tables of Declination to any other Meridian.

There is in the using of the Sunnes Declination, one principal thing to be considered: which is, that a Table of declination made for any particular place, dooth not serue generally for all places, but onely for such places as haue the like, or neere the same longitude: the reason is, because that the Declination is Calculated according to the true place of the Sunne at noone, at which time the Sunne is vpon the Meridian of that place for which the saide Tables are made: but you must note that the Sun doth not come to the Meridian in all places at a like time, although that in all places the Sunne being vpon the Meridian, makes the middle of that day. But for euerie 15. deg. Difference of Longitude betweene any two places, the Sunne comes sooner or later to the Meridian, by so many houres: for if the place bee 15. degrees to the eastward of the place prefired, then the Sunne comes sooner to the Meridian by one houre, and if it be 15. degrees to the Westward, later by an houre. And so consequently more or lesse, according to the difference of Longitude. By which reason, in what part of the world soener you be, you may worke for the Declination of the Sunne in that place, by the proportionall partes of 24. houres Declination, to the houre of difference in Longitude.

As for Example.

Being in Brasilia (a part of the West Indies) y<sup>e</sup> 10. of April this yeare 1608. whose Meridian is distant from the meridian of England, to the westward about 45. degrees, which is 3. hours of time that the sunne should come to the Meridian later there then heere at Lond. where the Table is made: for when it is 12. a clocke here it is but 9. there, and being noone there, it is 3. a clocke here. Therefore to apply this Table to that place, I finde the Declination for the day aforesaid, vnder our Meridian to bee 11. degrees 43. min. at noon, and by reason when y<sup>e</sup> it is 12. a clock at Brasilia, it is then at London 3. houres past. Therefore by the rule of proportion, I seeke what declination the Sunne hath at 3. a clocke after noone, as followeth. I take the difference of declination between the day aforesaid

## The Seavans Kalender.

aforesaid, and the next following which is 20. minu. then I say by the rule of 3, if 24. houres giue 20. minutes, what giues 3. houres the time of the difference of longitude, facit 2. minutes and 30 seconds, which (because the Declination increases) I adde to the number of the day proposed: so I conclude the Declination of the Sunne to be the 10. of Aprill at noone, in the Kingdome of Brasilia 11. degrees 45. minutes, omitting the seconds.

Againe, the day and time aforesaid in the Bay of S. Sebastian, whose Longitude is 58. degrees to the Eastward of London, answering to neere 4. houres of time, shewing that the sunne comes sooner to the Meridian in the Bay of S. Sebastian by 4. houres, then at London: by which reason the Declination is lesse there then at London: because the Declination doth increase, for if the Declination did decrease, it would be more there then at London: and to knowe the Declination of the Sunne in the Bay aforesaid, I take the difference betwixt the Declination of the 10. of Aprill, and the Declination of the day next before being 20. min. then I say, if 24. houres giues 20. minutes, what 4. houres? facit. 3 minutes, which deducted from 11. degrees 43. minutes, the Declination of the Sunne the 10. of Aprill aforesaid at London, leaueth 11. degrees 40. minutes, the Declination of the Sunne at noone in the Bay S. Sebastian, beeing that when it is 12. of the clocke there, it is but 8. a clocke at London, or in any place hauing the same Longitude.

### How to obserue the height of the Pole by the Starres.

**T**he working heereof by the Starres; to finde the height of the Pole, is all alike with the working thereof by the Sunne, for of you obserue any Starre vppon the Meridian, looke in the third or last section of the Ephemerides, amongst the monthes for the name of the Starre which you obserued, wherewith you shall find his declination either North or S. and the right ascension thereof in houres and minutes: and hauing taken the Altitude of any Starre vpon the Meridian you haue nothing to marke in the table for this but the Declination, which if it bee North, take the declination

## The Sea-mans Kalender.

clination of the Starre from the height thereof, the remainder taken from 90. leaueth the height of the Pole: but if the Starre hath so ith Declination, adde the Declination with the Altitude taken, and the product thereof taken from 90. leaueth the height of the Pole also to finde the time of any Stars comming to the Meridian, is set downe after the Table of the sunnes right ascension.

### Example.

The 25. of Nouember 1605. I obserued a Starre of the second bignesse, in the shoulder of Pegasus or the Flyinghorse, about 8. of the clocke in the euening, and found the Meridian Altitude thereof to be 51. degrees 18. minutes, and in the Kalender, in the second face thereof I finde the said Starre to haue 12. degrees, 58. min. North Declination: which taken from 51. degrees, 18. minutes, the height obserued leaueth 38. degrees 20. minutes, the height of the Equinotiall: the complement whereof 51. degrees 40. minut. is the height of the North Pole at London.

And so consequently for all those Stars whose Declination is taken from the Equinotiall: but for those Starres which are any thing neere to the Pole, whose distance or Declination is counted from the Pole their working is thus: you must note that beeing any thing farre to the Northward, some of those Starres will bee twice vpon the Meridian, viz. once abouts the poole, and once vnder the Pole: therefore if you obserue any Starre vpon the Meridian vnder the Poole, adde the distance of the saide Starre from the Pole to your Altitude obserued, the totall is the height of the Pole, but if you obserue any Starre vpon the meridian abouts the Pole, so much as is the Distance or declination of the said Starre from the Pole, you must take from the Altitude taken, the remainder is the height of the Pole.



## The Seamans Kalender.

### As for Example.

If at London you obserue the former Guard Starre beneath the Pole vpon the Meridian, you shall finde it to be 37. degrees, 29. minutes, vnto which if you adde 14. degrees 11. minutes, the distance of the said Starre from the Pole, the totall is 51. degr. 40. min. the height of the North Pole at London. Again, the same Starre obserued vpon the Meridian aboue the Pole, is 65. degrees 55. minutes, from which 14. degrees 11. minutes the distance afoze said taken, leaueth 51. degrees 40. minutes as before.

Note that being farre Northward, those Starres betweene the Equinoctiall and the Tropicke of Cancer, are best to obserue, and being betweene the said Tropicke and the Equinoctial, those stars about the pole are fittest for obseruation, and soe those that trauell farre beyond the line to the Southwards: the like order must bee kept by the Starres, betweene the Equinoctiall and the Tropicke of Capricornus, and those that are neere the south Pole.

And whereas the North Starre it selfe beeing verie neare vnto the Pole, it is the fittest Starre for to bee obserued, by reason of the nearenesse to the Pole. I haue soe your further ease, made an exact Table for the Declination of the North Starre from the pole, vpon euerie point of the compasse, being very commodious, by reason whereas the other Stars are onely to be obserued vpon the Meridian: This said North Starre by help of this Table following may be obserued at any time of the night, whose vse followeth after the said Table.

Heere



# The Seamans Kalender.

	Pointes of the Com- passe.		Degre.	Minutes	Of De- clinati- on.
If the guards be	N:W:b W		0	0	
	Nor west		0	34	
	N:w:by N		1	6	
	N:N:W	Then	1	36	
	N:by W	the	2	4	Vnder
	North.	Load	2	24	the pole
	N:by E	Sarre	2	40	
	N:N:E:	is	2	50	
	N:E: by N		2	52	
	North East		2	50	
	N:E: by E.		2	40	
If the guards be	E:N:E		2	24	
	E:by N:		2	4	
	East		1	37	
	E:by S		1	6	
	E:S:E:		0	34	
	S:E:by E.		0	0	
	South East		0	34	
	S:E:by S		1	6	
	S:S:E	Then	1	36	
	S:by E:	the	2	4	Above
	South.	Load	2	24	the pole
	S:by W	Starre	2	40	
	S:S:W	is.	2	50	
	S.W. by S.		2	52	
	S.W.		2	50	
	S:W:by W		2	40	
	W:S:W		2	24	
	W:by :		2	4	
	West		1	36	
	W. by N		1	6	
	W:N:W.		0	34	

Here followeth an exact  
table to know how much  
the north Star is, either ab-  
boue or beneath the Pole, the  
Guards being vppon any  
point of the Com-  
passe.

The vse of which Ta-  
ble is thus : hauing ob-  
serued the Altitude of the  
North Starre, marke so  
neare as you may, vppon  
what point of the com-  
passe the Guardes then  
are, which knowne resort  
to this table, and finding  
therein the said point vpp-  
on which the Guardes  
were at your obseruation,  
right against the same is  
the number of degrees &  
minutes, which the Star  
is eyther aboue or be-  
neath the Pole, which  
number so found, if it bee  
aboue the Pole must bee  
substracted from your al-  
titude taken, and if vnder  
the Pole, it must bee ad-  
ded to the said Altitude  
taken : which totall ad-  
ded, or remaine substract-  
ed, is the true height of  
the Pole it selfe.

As

## The Sea-mans Kalender.

As for example.

Observing the North Starre to be 58. degrees 30. minutes, when the Guardes are at the north east, I looke in the Table for the northeast point of the compasse, and right against the same I finde 2. degrees 50. minutes vnder the pole, which being that the North Starre is vnder the Pole, I adde his declination 2. degr. 50. min. to 58. degr. 30. minutes, his altitude obserued, and the the totall 61. degrees 20. min. is the iust height of the Pole it selfe in that place.

Againe, obseruing the North Starre to be 50. degrees 15. minu. aboue the Horizon, when the Guards are vpon the Southeast point of the Conipasse, I looke for southeast in the Table, and right against the same is 34. minutes aboue the Pole, which being that the Starre is then so much higher then the pole it selfe, I subtract 34. minutes, the declination of the Starre from 50. degrees 15. min. the Altitude taken, and the remainer 49. degrees, 41. minutes is the perfitt height of the Pole aboue the Horizon in the said place of obseruation.

And now hauing made plaine vnto you, the vse and profit of the saide table, it being indeed as necessary and commodious for the mariners vse, as any rule whatsoeuer, it resteth now to speake somewhat more particularly of the other fixed Starres, set down in the former Kalender, or Ephemerides, whose vse is manyfold and very excellent, but their vse for the finding of the Poles eleuation by their Declination, obserued at their being vpon the Meridian, being formerly shewed, it is now onely requisit to exp- plane vnto you, a brief and easie method for the exact and ready finding of the true time of any of the said fixed Starres, coming to the Meridian, at which time they are onely fit for to be obserued, for the knowledge wherof, I haue here placed a table of the right ascension of the Sunne for euery day of each month throughout the whole yeare, according to his true place for euery of the said dayes, formerly set downe in the Kalender or Ephemerides: the vse wherof followeth after the said Table.

*A Table*



# A Table of the Sunnes

Date	Ianua	Febru	Marc	Apri	May.	Iune.
	H.M.	H.M.	H.M.	H.M.	H.M.	H.M.
1	19:30	21 39	23 25	1 18	3 11	5 15
2	34	43	28	22	15	19
3	39	47	32	26	19	23
4	43	50	36	29	23	27
5	47	54	40	33	27	31
6	52	58	44	36	30	36
7	56	22 2	47	40	34	40
8	20: 0	6	51	43	38	45
9	4	9	55	47	42	49
10	8	14	58	51	46	53
11	13	18	0 2	55	50	57
12	17	21	6	58	54	6 1
13	22	25	9 2	2	58	5
14	26	29	12	6 4	2	9
15	30	32	16	10	7	13
16	34	36	20	14	11	18
17	38	40	23	18	15	22
18	42	44	27	22	19	26
19	46	48	31	26	23	30
20	50	52	35	30	27	34
21	54	56	38	33	31	38
22	58	59	42	37	35	42
23	21 3	23 3	46	41	39	46
24	7	7	49	44	43	51
25	11	10	53	48	47	55
26	15	14	57	52	51	59
27	19	18	1 0	56	56	7 3
28	23	22	1 3	0 3	0	7
29	27		1 7	4	3	11
30	31		1 11	7	7	15
31	35		1 15		11	

*right ascension in houres and Minutes.*

Date	July H:M	Augu H:M	Septe H:M	Octo H:M	Nonē H:M	Decē H:M
1	7 19	9 22	11.16	13 5	15 5	17.12
2	23	26	20	8	9	17
3	27	30	23	12	13	21
4	31	33	27	16	17	25
5	35	36	30	19	21	30
6	40	40	33	23	25	34
7	44	44	37	27	29	39
8	48	48	41	31	33	43
9	52	52	44	34	37	47
10	56	56	48	38	42	52
11	8 0	59	52	42	46	56
12	4	10 3	55	45	50	18 0
13	8	7	59	49	54	5
14	12	11	12 3	53	58	10
15	16	15	7	57	16 3	14
16	20	18	11	14 1	7	18
17	24	22	14	5	11	23
18	28	26	18	9	16	27
19	31	29	22	13	20	32
20	35	33	25	17	24	36
21	39	36	29	20	28	41
22	43	40	32	24	33	45
23	47	44	36	28	37	50
24	51	47	40	32	41	55
25	55	51	43	36	46	59
26	59	54	47	40	50	3
27	9 3	58	51	44	55	19 3
28	7	11 2	54	48	59	7
29	11	6	58	53	17 3	12
30	15	9	13 2	57	8	16
31	19	13	15 1	1		21
						25

G

A De.



## A Declaration of the former Table.



Thinke it not amisse, befoze I shew the vse of the former table of right ascention for the finding of the time of any starres comming to the Meridian, to explane vnto you what wee call right ascention. Know therefore, that in the Sphære there is right ascention, oblique ascention and meane ascention, which haue all seuerall diffinitions: but the rest being impertent, I will onely speake of Right ascention which is thus defined. Right ascention is that portion of the equinoctiall which commeth to the meridian or noonsted with any starre, or any part of the eclipticke: or more plainely it is, that number of degrees of the equinoctiall, comprised betwixt the vernal equinoctiall point or intersecion of the saide equinoctiall circle, and the first minute of Aries, and that starre or part of the eclipticke, which is vpon the meridian at the day or time desired. As for your better vnderstanding, if the beginning of Aries be vpon the meridian, or any point or starre in the saide beginning of Aries, then hath the said point or starre so scituated, no right ascention at al, by reason that the beginning of the Equinoctiall commeth to the meridian therewith: But if the beginning of Cancer, or any starre in that scituation be vpon the meridian, then is there with it vnder the same meridian 90. degrees of the Equinoctiall, or 6. houres of time, being that euerie 15. degrees of the equinoctiall, answers to one houre of time, shewing that that starre or point, which is in the beginning of Aries, shall come to the meridian 6. houres sooner then



## The Sea-mans Kalender.

then that other which is in the beginning of Cancer, and so of others: I doubt not but that these few wordes will suffice to giue you the better light to that which folloives. First therefore to finde the right ascention of the Sunne at any time: looke for the Month in the head of the Table, and for the day of the month at the left side of that face, where the month desired is, and in the common angle answering to them both, is the houre and minu. of the Sunnes right ascention.

As for example.

I desire the right ascention of the Sunne the 25. of May: first in the head of the Table I look for May, which found in the first colunne on the left hand, I looke for 25. and right against the same in the common angle, vnder the title May, I finde 4. houres and 47. minutes for the right ascention of the Sunne, the saide 25 of May.

These thinges thus known and considered, it is to bee noted, that whereas the Sunne hath a different number for his right ascention euerie day, and the Stars keep euerie one still a like number for his peculier right ascention, the reason thereof is this:

The Starres are all fixed in the eight Spheare, in which eight Spheare is also the Zodiacke placed, not only to limit the course and progresse of the Sunne in his continuall motion, but also to giue a certaine limitation to the Stars, who beeing fixed in anye part of the heauens, that certaine meridian or circle of south and north, which passeth thzough the center of any star, cutteth also in one place or other of the said Zodiack: which number of degrees so cut in the Zodiack, is the Longitude or distance of the said starre from the beginning of Aries, now the starre as I said being so fixed hath no motion but onely as the whole frame of the Zodiacke with the eight Spheare, and all the circles and stars therein placed, which as is apparant to the sight, is by the first moouer carried round about from east to west in 24. houres: but the naturall motion of the said eight Spheare, being from the west to the east, is so slowe, that it is vsensiblie, whereas the Sunne being of a very swift motiō in cōpariſon of the former, his motion being euerie 24 houres nere vpon a deg little moze or lesse makes his motion from

## The Sea mans Kalender,

the west to the east in the Zodiacke molle apparant: by his motion also describing the Zodiacke Circle, as neuer declining from the middle thereof: and further, the Sunne being the ruler of the day, and director of the night, is the sole and onely distinguisher of time: for this is apparant to the view of euerie one, that the Sunne being vpon the Meridian aboue the Horizon, makes the middle of the day: and being vpon the Meridian vnder the Horizon, makes also the middle of the night: which being (as I haue said) that the Sunne comes alwaies to the Meridian iust at twelue a clocke, it followes necessarily, that what Starre or point in the Zodiacke soeuer, hath greater Longitude then the Sunne, his right ascention is also greater then the Sunnes: and looke how much the saide right ascention is more then the Sunnes, by so much later then the Sunne must the saide Starre or point come to the saide Meridian, proportionally after 15. degr. to an houre, and one degree to 4 minutes of time.

Take this therefore for a generall rule, that if the right ascention of the Starre, whose time of coming to the Meridian you desire to knowe, bee greater then the right ascention of the Sunne, substract the Sunnes right ascention from the said Stars right ascention, and the remainder (if it be lesse then twelue) is the houre and minute that the Starre comes to the Meridian after noone: and if the remainder bee more then twelue, substract twelue also, and the remainder shewes so many houres and minutes after mid-night: But if the Sunnes right ascention be greater then the Starres right ascention, then adde twentie foure houres to the Starres right ascention, and substract the Sunnes right ascention there from as befoze, the remainder shewes the Starres coming to the Meridian after noone: if it be lesse then twelue, or if it be more then twelue, twelue also substracted, the remainder shewes so many houres and minutes after mid-night,

### As for Example:

The 15 of Nouember, I desire to knowe at what time Occulus Tauri, or the Bulles eye will be vpon the Meridian: first in the former Table of the Sunnes right ascention, I looke for the  
15 of

## The Sea-mans Kalender.

15. of Nouember, where I finde the Sunnes right ascention for that day to be 16. houres and 3. minutes: and in the Kalender of Ephemerides among the fixed Starres, I finde the right ascention of the Bulles eye to be 4. houres 13. minuts: which being lesse then the Sunnes right ascention, I adde 24. houres to 4. houres 13. minutes, and from the totall 28. houres 13 minutes: subtracting 16 houres 3. minutes, the Sunnes right ascention rests 12 houres 10 minutes, which being more then 12. houres, I take away also 12. houres, & so there rests 10. min. after midnight, that Occulus Taurie comes to the meridian the said 15. of Nouember.

Againe, the tenth of Aprill, I would know at what time the Lyons taile will be vpon the Meridian: in this Table I finde the Sunnes right ascention, the day aforesaide, to be 1 houre 51 minutes, and in the Kalender I finde the right ascention of the Lyons taile to be 11. houres 29 minuts: then subtracting 1. houre 51. minutes, the sunnes right ascention, from 11. houres 29. min. the Starres right ascention, rests 9. houres 38 minuts, shewing that 38. minutes after 9. a clocke at night, the saide starre shall be vpon the Meridian.

## The Monthly time of each Starres being in rule for obseruation.

### Ianuarie.

Oculus Taurie, the whole constellation of Orion, Hircus the Goate, the great Dogge, the little Dog, the greatest part of Leo, the Crofiers, Canopus and the south Triangle.

### Februarie.

The whole constellation of Leo, Arcturus, the Centaure, & the Virgins Spike.

### March

The hinder part of Leo, Hydra, Virgins Spike, the Centaur, Arcturus, the Ballance and Scorpio.

### Aprill.

The Centaurs, Ballance, Scorpio, Lyra, and Sagitarius.



## The Sea-mans Kalender.

May.

Scorpio, Lira, south Crowne, and Eagles heart.

June

South Crowne, Eagles heart, swans taile, and the Dolphin.

Iuly

The Dolphin, Fomahand, and Pegasus shoulder.

August

Fomahand, Pegasus, Cassiopeia, Andromeda, the Whale, and the Ramme.

September.

Cassiopeia, Andromeda, the Whale, the Ramme, Medusa, Perseus, and Eridamus.

October.

All the former of September, & Oculus Taurie, Orion, Hircus, the greate Dogge, the Crosiers and Canopus.

Nouember.

All the former of October, with the little Dogge, and the south Tryangle.

December.

The Whale, the Ramme, Medusa, Perseus, Eridamus, Occulus Taurie, Hircus, Orion, Canopus, great Dog, little Dog, Hydra and Leo, in the Monthes aforesaid, at one time or other of the night, these Stars are vpon the Meridian.

Having sufficiently explained vnto you the manner and way how both by the sunne and starres to attaine to the true height of the pole or latitude of any place, I purpose now God willing to speake somewhat of the longitude: which as the former is most easy, and the finding therof knowne almost to al seamen, so is the other as vncertaine and hath not as yet hitherto bin found out or known exactly to any. albeit that many learned men and of great experience, haue laboured very earnestly for the same, & many good meanes haue they inuented as helpes and assistance vnto the mariners in their long navigations and trauailes, by which though with great labour, care and industry, they transport themselves

## The Sea mans-Kalender.

selues to the vtmost regions of the world, with farre more ease, and facilitie they might doe it, if they could as perfectly & readily finde the Longitude at all times, as they may the Latitude: for then hauing sailed many daies in vnknown pathes by the large and spacious seas, & induring all those vniurable troubles, miseries, vnspeakeable calamities, which do for the most part attend vpon long voyages: yet after all this, if vpon the first faire opportunity, they could readily with the Latitude finde also the Longitude, their fore-passed troubles would be ioyfully remedied, being that these two (like louing Sisters) would apply much pleasing comfort to their colde stomacks, after their tedious trauailes, by giuing them the true prick or place of their then present being. Peter Appian, and Gemma Frisius, hath written thereof, as also some others, but truely in my opinion, it was neuer brought to such exquisite perfection, as it is now adaies, and for me to write thereof, were but as it were to set vp a Candle at noone daies, rather to shew mine owne folly, then to lighten those that knowe a better way then my selfe: in which dooing well, may Apelles saying *Ne sutor ultra Crepidem* bee applyed vnto me: But for my excuse, I do intreat the iudicious to perswade themselves, that it is farre from my thoughts to set down any thing in this for a president to them, but onely in good will to shew my opinion thereof, to the Ignorant, being as folloiweth.

First therefore, the Latitude being knowne by finding the Longitude also, you haue the true prick or place in the Globe, or Carte, where your ship is, which to finde nearest is two waies, one by dead reckoning, the other by obseruation: but dead reckoning, as they call it, being as I take it moste vsed, I will speake first thereof, by which if it were possible that this reckoning could be exactly and precisely kept, it would giue both Latitude and Longitude without any obseruation at all, the different Latitude being onely the distance that the Ship is departed from the paralell where shee last was, either Northward or Southward, and Longitude beeing the distance that shee is departed from the Meridian, either eastward or westward: for the knowledge whereof, these thinges are principally to

## The Sea-mans Kalender.

to be considered.

First the true pꝑicke oꝛ place of the ships being at the beginning of the voyage.

Secondly, a sound and experimented iudgement of the way that the ship maketh, with euerie swift of winde.

Thirde to know exactly how much the Compasse doth barrie from the true North oꝛ South point, vpon which the Needle is toucht, either eastward oꝛ westward, in as many seuerall places as conueniently may be obserued.

Fourthly, to note diligently the floods oꝛ Currents, which may cause the Ships way to be more Leeward, oꝛ otherwise then expectation, and to giue allowance of her course & way accordingly.

Fifthly, the seuerall points of the Compasse that she makes her course good vpon, and what way she hath made vpon euerie point.

Sixtly, to bring those seuerall courses into one streight lyne, thereby to knowe what course she hath made good, with the nearest distance vpon the said point oꝛ Rombe, that shee hath made her way good vpon.

And lastly, knowing how many Leagues doth raise oꝛ lay a degree vpon the said Rombe, the true reckoning of your saide course & distance, giues you the difference of Latit. oꝛ the paralel where the ship then is: and also knowing how many Leagues answere to a degree of east and west in the said paralell, the course, distance and Latitude giues the difference of Longitude oꝛ the Meridian, vnder which the Ship then is: the interseccion, of which saide paralell and Meridian, is the pꝑicke oꝛ place of the ships then being, of which thinges I will speake more particularly afterward.

Now it resteth to speake something of knowing the Longitude onely by obseruation, which is very necessarie to be knowne, that thereby the one may make tryall of the other, being that if the account by dead reckoning, and also by obseruation, doe both agree in the Latitude and Longitude, then may you be well assured, that you know truly the place where you then are. which Longitude by obseruation as thus knowne. prepare a verie perfect and true running glasse, which may pꝑecisely runne 24 houres without error, and about the tyme that you purpose to set saile, set the saide glasse



## The Sea-mans Kalender,

glasse a running iust at twelue a clocke, when the Sunne is vpon the Meridian: and being runne out, be sure to turne the said glasse instantly as it is out, not loosing any time in the turning of it, and so hauing verie warily kept the saide Glasse till you thinke good to make an obseruation, at which time it is requisite to haue in readinesse a halfe houre-glasse, and a minute glasse, that if the 24. houre-glasse be out befoze the sunne come to the meridian, then so soone as it is out, to turne the halfe houre-glasse or min-glasse, as you see occasion, thereby to know precisely how much the 24. houre-glasse is out befoze the Sunne comes to the meridian: for if the Sunne is vpon the Meridian iust when the 24. houre-glasse is out, then you may assure your selfe that you haue sailed North or South and are still vnder the same Meridian that you were at the first: but if the twentie foure houre glasse be out, befoze the Sunne come to the Meridian, for euerie foure minutes that the Glasse is out befoze noone, your difference of Longitude is one degree to the west ward, and for euerie houre 15. degrees. And contrary, if the Sun come to the meridia befoze the Glasse is out, then according to the same proportion of time, is your difference of Longitude to the east ward, which difference of Longitude, if you multiply by the number of miles answerable to a degree of Longitude in that latitude where you then finde your selfe to be, the product giues the miles of distance, that you are either to the east ward or west ward of the Meridian, that you departed from.

The like may also be effected by any of those fixed Stars, whose true time of conning to the Meridian you knowe, for if the accompt of time precisely kept by your glasse, and the starres conning to the meridian as you finde by your table of right ascention doe iustly agree, then are you still vnder one and the same meridian, but if the time be past by your accompt, that the said starre should be vpon the meridian befoze the Starre dooth come to the meridian, for euerie houre that the Starre comes to the meridian after the saide time past, your difference of Longitude is fifteene degrees to the West ward, and for euerie houre that the starre comes to the meridian befoze, by your accompt of time truly kept,

## The Sea-mans Kalender

it should be vppon the Meridian, your difference of Longitude is 15. degrees to the eastward. Thus much shall suffice to haue spoken concerning my opinion for finding the longitude at Sea by obseruation, and now it restes to speake somewhat of some necessarie helps, for the finding thereof by dead reckoning, as is before promised.

### Of the variation of the Compasse.

Concerning the variation of the Compasse, it hath beene very learnedly treated of by diuers of our owne Countreimen, and in our vulgar tongue, and namely by Maister Norman and Maister Burrowes in their bookes called the New Attractiue: & since that, moste excellent and ingeniously written of by that rare and learned Mathematician of our time. Maister Wright in his Book of the Correction of errors in Nauigation: as also in his translation called the Haven-finding Art: in which respect it is needeles for me heere to write any thing thereof, onely let it suffice to speake a little thereof, as being necessarie to the knowledge of the foregoing matter, for them that would willingly note how much the Compasse doth varrie in seuerall places of their sailing, I thinke it best to haue the Needles of their Compasses touched vppon a good stone, and so placed directly vnder the North point of the flie, without allowing any variation at all, the outer edge of the said flie to be graduated each quarter into 90. degr. for the ready reckoning of the degree that the compasse dooth vary from the true North or South, eyther toward the East or West: ouer which flie, it is necessarie to haue a round circle of brasse, with two sights vpon the same, & one directly against the other, at opposite points to be raised perpendicularly where occasion shal serue: which circle, with the sights thereon, as I haue said, being placed vpon the Glasse ouer the Fly within the box, where the Fly or compasse is, when you wold obserue the variation of the compasse iust, either at the Sunnes rising or setting, turne the sights in the brasse circle towards the Sunne, and looking throug the same, marke precisely how many deg. the sun riseth or setteth from the east or west point of the Fly or compasse: for if the sun be in y<sup>e</sup> Equinoctiall, hauing then no amplitude, so much as is the difference of the Suns rising or setting from the east or west points, shewd  
by

## The Seamans Kalender

by the compasse, is the variation of the compasse from the true North or South, but if the sunne bee either to the Northward or Southward of the Equinotiall, hauing amplitude then is there a respect also to bee had to the Sunnes amplitude, as thus: if the Sun haue north or south amplitude, and that you obserue the sun to rise or set so much frō the east or west point of y<sup>e</sup> compasse, as is the suns amplitude, & likewise the same way y<sup>e</sup> the amplitude is, then hath the compasse no variation: but if the sunne hauing North amplitude riseth notwithstanding more Northerlye by your compasse, then the said amplitude should bee the degrees of true amplitude, deducted from the amplitude, which the compasse sheweth, leaueth the variation of the compasse to the eastward of the north: but if the true amplitude be greater, then the compasse sheweth, the one deducted from the other, leaueth the variation to the westward of the North: and if the amplitude be southerlye & the compasse shewe the sun to rise northerly, both the differences added together, giues the variatiō easterly: or if the amplitude be northerlye, & the compasse shewes it to be southerly, then both the differences added together, giues y<sup>e</sup> variation westerly. Al this is to be vnderstood, whē you obserue by the amplitude or time, viz. at the suns rising: for if you obserue the setting thereof, then by adding or deducting the differences betwixt the true amplitude knowne, and the amplitude giuen by the compasse, the totall or remaine shewes the compasse to varrie so much to y<sup>e</sup> contrary side: an example wil make al this plain vnto you, which let be thus proposed. Suppose that being at sea, you finde by the Table of signes hereafter set downe (or by some other meanes) the suns amplitude at that time to be 20. degr. to the Northward, & setting the sun at his rising by the compasse, (as is before shewed) you finde that the sun riseth 35. degr. to the northward of the east, which is somewhat to the northward of the northeast & by east point, therfore subtracting 20. degr. the suns true amplitude from 35. degr. the amplitude which the compasse sheweth, the remaine being 15. degr. sheweth the compasse to be so much varied from the north to the east ward, which is one whole point, & about 1/2. otherwise the sun hauing the same amplitude northerly, (as is aforesaid) and setting him at his  
setting



## The Sea-mans Kalender.

setting with the Compasse, the said Compasse sheweth him to set onely five degrees to the northward of the west, which deducted from 20. degrees, the true amplitude leaueth 15. degrees for the variation of the Compasse to the eastward, as before.

### Another example.

Suppose that the Sun hauing 23 degrees of south amplitude, and the compasse sheweth his amplitude of rising, to be a 11. degr. northerly, adde 23. degrees, the true amplitude with 11 degrees of contrarie amplitude, which the Compasse sheweth, and the product 34. degrees, being three whole pointes, and somewhat more, sheweth that the Compasse is so much varryed from the true north, to the eastward.

Againe, the Sunne hauing the like amplitude southerly, you obserue at his setting, and finde by your compasse that hee setteth 11 degrees northerly, adding the two amplytudes as aforesaide, 23 and 11, the product 34 sheweth the variation so much to the westward, being that in the obseruation at his rising, the east and by north points of the Compasse, standeth where the east south east should be: and at his setting in the other obseruation, the west and by north points of the Compasse, pointeth to the Sunne, in which place shold be the west south west points. These few words wil suffice, being (that albeit to the ignorant they seeme somewhat darke) yet in the practise thereof, they shall finde it I doubt not, but verrie plaine and easie for their vnderstanding, otherwise there are by sundrie sortes of instruments to finde the variation, but others hauing already written thereof, I haue thought good also to shew my opinion of this plaine and easie way, knowing that the Harriner hauing made experience of many waies, wil onely vse that which hee findeth best, both for his ease, profit, and truth thereof.

How

*How many Leagues sailing vpon any point  
of the Compasse will raise or lay a degree  
of Latitude, and what difference of Lon-  
gitude you make therewith.*

**T**his is so common in euerie booke, that I neede not to wright thereof, but onely being that it is a necessarie helpe to that which hath beene befoze spoken of, it is not amisse to set it heere downe, being as followeth.

First sailing south or north, you keepe still one Meridian: and in sailing 20. english Leagues, you either raise or depresse the pole one degree: But if you saile vpon the first point or Rombe from north or south, either eastward or westward, you must saile 20 leagues and  $\frac{1}{2}$  part to raise or lay a degree of Latitude: and hauing so changed your parralell one degree, you are also departed from your first Meridian, 4 leagues that way which your course was.

Vpon the second point or romb from north or south, 21. leagues and  $\frac{1}{2}$ , raise or lay one degree of Latitude, and your distance from the first meridian is 8. leagues and  $\frac{1}{2}$ .

Sailing vpon the third point, 24. leagues, raise or lay a degree and distance from the first Meridian, is 13. leagues and  $\frac{1}{2}$ .

Vpon the fourth point 28. leagues,  $\frac{3}{4}$  raise or lay a degr. of Latitude, and distance from the Meridian, is 20. leagues.

Vpon the fift point, 36. Leagues, raise or lay a degree of Latitude, and distance from the Meridian is 30. leagues.

Sailing vpon the first point or Rombe 52. Leagues and  $\frac{1}{2}$ , raise or lay a degree, and hauing altred your Latitude one degree vpon that point, you are departed from the first Meridian 45. leagues and  $\frac{1}{2}$ .

If you saile vpon the seauenth point, being the next from the east or west, you must saile 102. leagues, and  $\frac{2}{3}$  befoze you raise or lay the pole one degree, and then are you 101. leagues from your first Meridian, but if you saile east or west: then are you still in a paralell and neither raise nor lay the pole at all.

## The Sea-mans Kalender,

To finde the distance betweene any two places, knowing the Longitude and Latitude of them.

If the two places differ onely in latitude, then are they both vnder one and the same Meridian: and to know the distance betwixt them in miles or leagues, multiply the number of the degree of difference, by 60. miles, or 20. leag, & product of which multiplication giues the true distance betweenes them, in miles or leagues according as you worke them, being that 60. miles or 20. Leagues make one degree of a great Circle: but if the one place haue North Latitude, and the other South, then adde both their Latitudes together, and worke as aforesaid: and if both the places are vnder the Equinotiall, then haue they no Latitude: and there likewise 60. miles, or 20. leagues makes 1. degree, and the working is like the former, if the difference be vnder 180. degrees: for if the difference be moze then 180 subtract the said difference from 360 and multiply the remainder by 60. or 20. as afoze.

These are so plaine and easie, that they neede no examples: but if they differre both in Longitude and Latitude, or in Longitude onely, in any paralel beside the equinotial, the working is somewhat moze difficulte, by reason that the further the parralels are distant from the equinotial towards either of the poles, the shorter they are: and the shorter the parralels are, the fewer min. or miles make a deg. so that whereas in the equinotiall 60. min. or miles make a deg. in our paralell where the pole is raised 52. deg. 37 mi. make one deg. viz. one deg. in the Latit. of 52. in running E. or W. answers to 37. miles: for which purpose, as also for diuers necessarie vses, I haue here added a Table, shewing the miles of distance and minut of time answerable to a deg. in euery seuerall deg. of Latitude, from the equinotial towards either of the Poles: And when you know the miles answerable to a degree in the paralel desired, if the difference of the two places be onely in Longitude, multiply the difference of their Longitude by the number of miles, answerable to a deg. and the product sheweth the distance in English or Italian miles, betwixt the said two places.

Example



# The Sea-mans Kalender.

## Example.

London and Middlebrough haue both (in a manner) one Lati. viz. about 52. deg. and I finde in this Table, that in the parralell of 52. 37. miles make a gree of Longitude, the Long. of London is 25. deg. 50: min. & the Long: of Middleborough is 29. deg: 40: min. which subtracted one from another, leaues 3. deg. 50. min for the difference of Longitude: then multiplying 3. deg by 37: miles, the product is 111. miles: then for 50 min. I say by the rule of three, if 60. minu. giue 37. miles, what giues 50: min? facit neere 31, which added to 111, makes 142 miles, or 47 leagues, and a mile for the distance betwixt London and Middleborough.

But if the 2: places differ both in Longitude. and Latitude, the is the working more difficult then either of the former: for first you must take the difference of y<sup>e</sup> two: places in Lon: & then their difference also in Lati. and multiplying the deg: of their difference in Latitu: by 60: set the product thereof by it self, for the first number: then multiply y<sup>e</sup> difference of Longitude, by the number of miles answerable to each Latitude seuerally, & adde both the products together: the halfe whereof set downe: for your second number, and multiplying each of these said 2: numbers into it selfe squarely, adde both the products together, & extracting the square roote thereof, the said square roote is the distance of miles, betwixt the two places desired.

## As for Example.

To goe directly in a right line from Callice in France to Constantinople in Gretia: I finde by the Tables following, that the Longit. of Callice is 29 deg: 10 mi. & the Latitude thereof 50: deg: 40 min. Also the Longitude of Constantinople is 61 deg: 20: mi: & the latitude 44 deg: 40: mi: the subtracting the

Deg. of Latit.	Miles to a deg.	Deg. of Lati.	Miles to a deg.
0	60	60	30
10	59	61	29
15	58	62	28
18	57	63	27
21	56	64	26
24	55	65	25
26	54	66	24
28	53	67	23
30	52	68	22
32	51	69	21
34	50	70	12
35	49	71	20
37	48	72	19
38	47	73	17
40	46	74	17
41	45	75	16
42	44	76	15
44	43	78	14
46	42	79	12
47	41	80	11
48	40	81	10
49	39	82	9
51	38	83	8
52	37	84	7
53	36	85	6
54	35	86	5
55	34	87	4
57	33	88	3
58	32	89	2
59	31	89	1

# The Sea-mans Kalender.

the lesser Longitude from the greater, the difference of Longitude is 32. deg. 10. min.

Also I take the one Lattit. frō the other, and there rests 6. deg. for the difference therof: which 6

degr. multiplied by 60 miles, produceth 360 miles for the distance betwixt the paralell of Callice: and the paralell of Constantinople. Now for the distance betwixt Callice, and the meridian of Constantinople, I multiply thirtie two degrees ten minut. the difference of Longitude by thirtie eight, the miles answerable to a degree in the paralell of Callice, and the product is 1222. miles, then I multiply thirtie two degrees ten minutes, the aforesaid difference of Longitude by 42. the miles answering to a degree in the paralell of Constantinople, which product being 1351 miles, is the distance betweene Constantinople, & the meridian of Callice: those two distances added together make 2573. the halfe whereof being 1286 is the meane distance betwixt the meridians of the saide two places: so haue you two numbers, viz. 360. miles, the distance that the paralell of Constantinople is to the Southwards of Callice, and

1286. miles, the distance that Constantinople is to the eastward of the paralell of Callice: therfore if you multiply 360 into it self, the product is 129600, and likewise multiplying 1286. into it selfe, the product is 1653796. which both added together, make

1783396, the square roote of which number is the distance desired: which to help those that are not perfit in extraction of rootes, I haue heer set down the working thereof as followeth

First I set downe the proposed number with a quotient, and vnder the last figure, I put a prick: and so likewise vnder each other figure toward the left hand, leauing betwixt each prick one figure vnprickt: so haue I vnder this number 4 prickes, signifying that the

Constant. 61. deg. 20. mi. }  
Callice 29. deg. 10. min. } Lō  
Difference 32. deg. 10. m }  
Callice 50. degr. 40. min. }  
Constant. 44. deg. 40. mi. } La  
Difference 6. degr. 0. mi. }

1 2 2 2  
1 3 5 1  
2 5 7 3  
1 2 8 6

1653796  
129600  
1783396

1783396 | 1  
I

20  
I  
20  
roote

# The Sea-mans Kalender.

roote must consist of foure figures, and to finde them out, I seeke what is the greatest square number, ouer the first prick, which is 1. therfore I put 1. in y<sup>e</sup> quotient for the first figur of the root, & cancell the figure ouer the first prick: then to finde the 2. figure of the roote, I multiply the quotient by 20. which being 9

1. doth neither multiply nor deuide: therfore I seek how often 20. is contained in 78. the num-

ber of the second prick, which you must take no oftner then y<sup>e</sup> the square of the said number being added therewith may bee likewise taken

there frō, so I see 3. times 20, is 60. & the square of 3. which is 9. added therto, is 69, therfore I put 3 in the quotient, & taking 69. frō 78 the number ouer y<sup>e</sup> second prick leaues 933. to the third

prick: Then for the third figure of the roote, I multiply 13. the quotient by 20, the product is 260. which I seeke how often it may be taken out of 933 & I find y<sup>e</sup> 3 times 260 is 780. wher-

unto y<sup>e</sup> square of 3 being added, maks 789 therfore I put 3. in y<sup>e</sup> quoti. & subtracting 789 from 933. rests 14496. for the fourth prick: the for y<sup>e</sup> last figure of the root, I multiply 133. the whole

quotient already found by 20, and the product is 2660. which may be taken 5. times in 14496 for 5. times 2660 is 13300 vnto which 25. the square of 5. added, makes 13325. therfore I put 5. in the quotient, for the fourth & last figure of

the roote: and making my subtraction as afore, the worke will stand as you see, by which you may knowe the square roote of the proposed

number to bee 1335, & verie neere. So I conclude the true distance betweene Calice and Constantinople to bee 1335. miles, and neere halfe a mile. The manner how to extract the roote of any number, is set downe more at large

hereafter.

$$\begin{array}{r} 1783396 \overline{) 13} \\ 169 \end{array}$$

$$\begin{array}{r} 20 \\ 13 \quad 3 \\ 20 \quad \text{---} \\ 60 \\ 260 \quad 9 \\ 3 \quad \text{---} \\ 69 \\ 789 \end{array}$$

$$\begin{array}{r} 1 \\ 944 \\ 1783396 \overline{) 133} \\ 169 \end{array}$$

$$\begin{array}{r} 789 \\ 133 \\ 20 \quad \text{---} \\ 2660 \\ 5 \end{array}$$

$$\begin{array}{r} 13300 \\ 13311 \\ 94471 \\ 1783396 \overline{) 1335} \\ 169 \end{array}$$

$$\begin{array}{r} 789 \\ 13325 \end{array}$$



## The Sea mans Kalender.

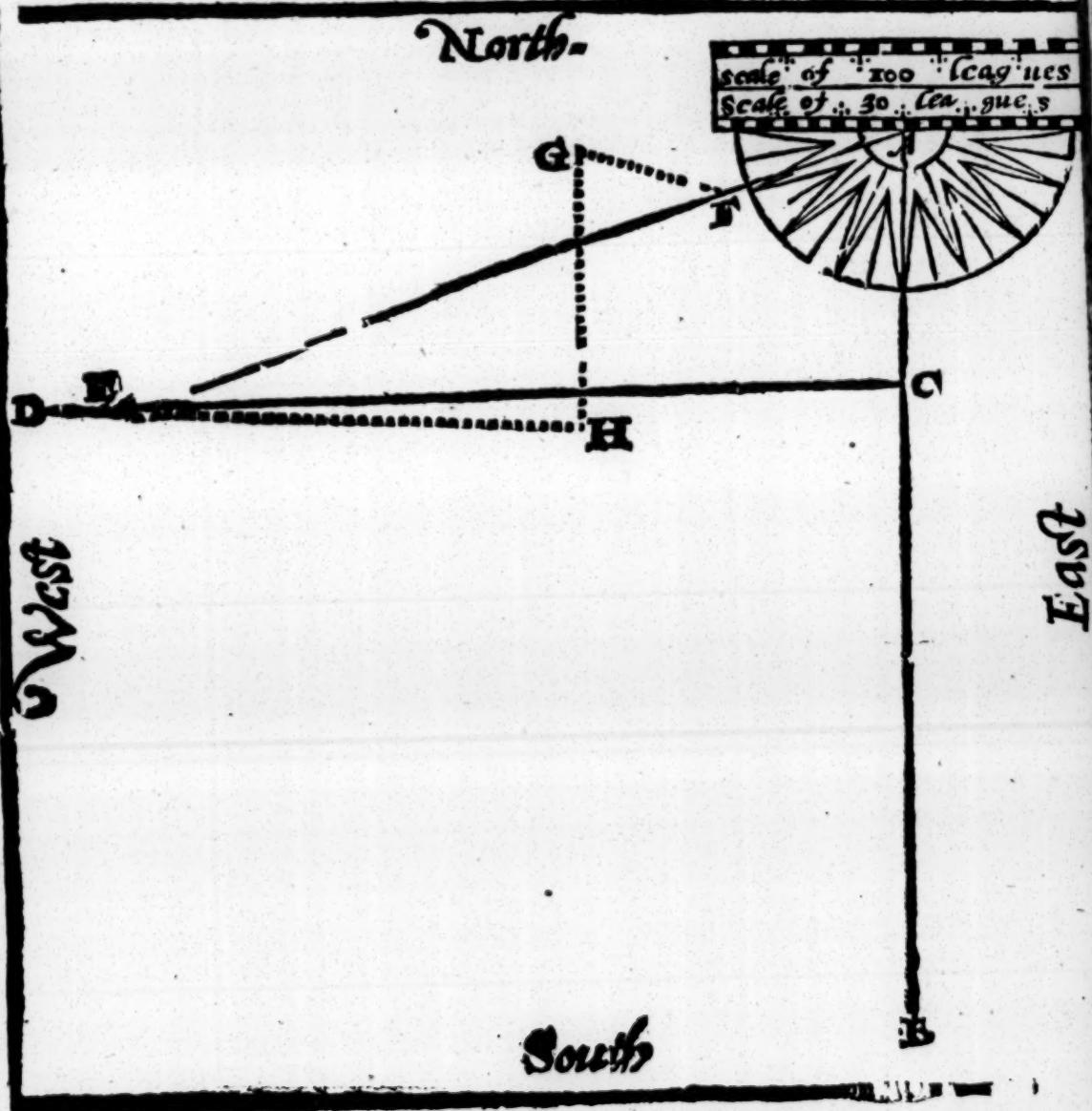
The ingenious Mariner may saile by knowing the true Longitude and Latitude of places, to any place assigned, as well as by his Sea Card, by the helpe of the Trauerse boord and a Protractor in this manner: first vpon the boorde or paper lined with Meridians and paralels, or to them that can make a right Angle vpon any prick or point, a sheete of cleane Paper is sufficient to keepe a Trauerse vpon: To know your course from the place where you are, to any other place assigned: as I say vpon your boorde or paper make a prick for the place where you then are, and from the said prick drawe a right lyne to represent the Meridian of the same place, then placing the center of the protractor vpon the said prick, lay the North or South point of the Arc or protractor, as the place beareth vpon y line ready drawn. Then by the last Chapter learne the distance of miles betwixt the place where you are, and the paralel of the place you are bound to or more briefly, what portion of the Meridian is comprized between the Lat. of y two places, that distance by the scale of the protractor apply to the Meridian by you drawne, & where the distance endes, draw another line square or at right angles to the other, either east or west, as the scituatio of the place assigned requirerh: and by the former Chapter learne the distance betwixt the Meridian by you drawne, & the meridian of the other place assigned: which knowne by your scale, apply that distance to your lyne of East or West, and where that number of distance endes, make another prick for the true scituatio of your place assigned: then laying a thrid or ruler from the Center of the protractor, being the place where you are, and extending it to the other prick last made the edge of the ruler or lyne shewes vpon the protractor, the point of the compasse, that the place assigned beares from the place where you are: & the scale applied to the said line or edge of the ruler, shewes the distance: also the distance may be knowne by extracting the square roote, as is before shewed: an example of this, and for the vse of the trauerse boord, and so an end.

A Ship being at the Lysard, in y south west partes of England, whose long. & lati. I finde in the Table following to be 18. deg.

## The Sea-mans Kalender.

deg. 30. min. & 50. deg. 10. min. is bound for an Island in the Ocean Sea called Maida, whose Long. I finde in the same Table to be 2. deg. 40. mi. & lati, 46. deg. 40. mi. the difference of their lat. is 3. deg. 30. min. which is 210. miles, or 70. leagues: therfore from

### The Type of a Trauerseboord and a Protractor.



## The Sea-mans Kalender.

the prick of point A. I draw the line A.B. in the traaverse boord  
 heere adioyning, and vppon the point A. I place the Center of the  
 protractor, being one halfe of the Mariners Compasse, the middle  
 point whereof representing the north or south (as occasion serues)  
 I lay vpon the line A.B. and applying 70. leagues (whereof the  
 scale on the edge of the protractor containe 100) from A. towards  
 B. Where the said 70. ends, I make a prick marked with C, so is  
 A.C. 70. Leagues, the distance between the Lizard & the Para-  
 lell of Maida: then from C, I draw the line C.D, at right angles  
 to A.B. and by the former chapter I finde the distance betweene  
 Maida, and the Meridian of the Lizard to be 629. miles or 209.  
 Leagues, and 2 miles: which by the scale aforesaid applied to  
 the Line C.D. at the end of the said distance, I set a prick marked  
 with E. so is the line C.E: 209.  $\frac{1}{2}$  leagues, the distance that Maida  
 is to the westward of the meridian of the Lizard, or the line A.B.  
 then the protractor lying as at the first, I lay a ruler from the Cen-  
 ter thereof, to the last prick E. and with the former scale, measu-  
 ring along by the edge of the ruler from A. the first prick, to E the  
 last: I finde the distance to be 222. leagues, and the ruler cuts the  
 point West and by south and halfe a point to the Southwards:  
 so I conclude the Ile of Maida to be distant from the Lizard 222.  
 leagues, and the direct course west and by south, and halfe a point  
 southwards.

But if the winde scant or be contrary, so that you cannot saile  
 by the direct course, then must you keepe a reckoning how many  
 leagues you saile vppon euerie other point: and where you change  
 your course, there place the Center of the protractor, keeping the  
 Meridian of the North or South line of the Protractor paralell,  
 to the Meridian drawne on the Traaverse boord, and laying a ru-  
 ler from the center of the protractor, along that point vpon which  
 the Ship maketh her way, and to the edge of the ruler so placed,  
 apply so many leagues of the scale, as the Ship hath sayled vpon  
 that point, and then where that number endes, if you set a prick  
 for the place where the Shippe then is, and vppon that prick place  
 the center of the protractor, laying as before the middle point  
 thereof paralell to the Meridian or South line first drawne, and  
 then



## The Sea-mans Kalender.

then laying a ruler to the center of the Protractor, being the place where the ship then is, and to the place assigned, it shewes upon the Protractor, the point how they beare, and the scale applied thereto, shewes the distance, as in the former example: hauing sayled from the Lyzard, in the right course 50. leagues, being then in the point F. the winde cometh to an other point, so that she maketh her way west and by north 40. leagues: at the end of which course, is the letter G. from thence she runneth south 75. leagues: at the end of which course is H. then from H. to knowe the distance, and what course must bee kept to the prescribed place of Maida marked with E. I place the center of the protractor vpon H. and the middle point of the Fly, which is then the north point paralell or equidistant to the first lyne A.B. which so placed, I lay a ruler from the center thereof to E. & the course is West and halfe a point to the North, 125. leagues.

Note that it is necessarie to haue vpon your protractor two severall scales, a greater and a lesser, for the greater the scale is you keepe your reckoning by, the truer shall your account be.

## Necessarie questions of Nauigation, with their answers.

**Q 1** If I saile from the paralell of 50. degr. 70. leagues vpon a Southwest course, I demaund how much I lay or depresse the pole, and how many degrees and leagues I depart from the meridian?

**A** Pole depressed two degrees, 28. minutes, difference, of Longitude three degrees, 45. minutes, leagues from the Meridian 50.  $\frac{1}{2}$ .

**Q 2** If I saile from the paralell of 40. degrees, vpon a west Northwest course, vntill I raise the pole 3. degrees 30. minutes, I demaund how many leagues I haue sailed? and how many degrees and leagues I haue departed from the Meridian?

**A** Leagues sailed 182  $\frac{1}{2}$ ; difference Longitude 12. degrees 20 minutes, leagues from Meridian. 164  $\frac{1}{2}$ .

B 3

Q 3 From

The Sea-mans Kalender.

Q 3 From the paralell of 47. degr. if in sayling 108. leagues betweene west and North, I raise the pole 3. degrees, I demaund vpon what rumbe I haue sailed? as also how many degrees and leagues I am from the Merid. from whence I began that course?

A Rumb north west and by west, difference Longitude 6. degrees 46. minutes, leagues from the meridian 86.  $\frac{1}{2}$

Q 4 If from the paralell of 50. degrees, I saile so long betweene north and east, till I raise the pole 6. degrees, and depart from the merid. 4. deg. I demaund vpon what point of the Compass I haue sailed, and how many leagues I haue runne?

A The course is neere north northeast, leagues runne 128.

Q 5 If from the paralell of 50. degrees I saile north west, vntill I am 4. degrees from the meridian where I began my course, I demaund how many leagues I haue sailed, and how much the pole is raised?

A Leagues sailed 70.  $\frac{1}{2}$ , Pole raised 2 degrees  $\frac{1}{2}$

Q 6 Two ships departing from one place in the paralell of 50. degrees, the one in sayling 145. leagues towards the west, hath raised the pole 4. degrees, and the other hath raised the Pole 7. degrees, and is 95. leagues west from the meridian of the place from whence he began his course: I demaund by what course the said ships haue sailed, how farre they bee a sunder, and by what course they may meete?

A The first ship hath sailed north west and by west, 16. mi. of a degree westwards: The second hath sailed North west by north 2. degrees, 45. minutes westwards, 172. leagues, half a mile they are a sunder 65. leagues, three quarters of a mile: and the course betweene them is north north east, and south south west.

Q 7 Two ships departing from one place in the paralel of 60. degrees, the one in sayling 145. leagues towards the west, hath raised the pole 4. degrees, and the other hath raised the pole 7. degrees, and is 95. leagues west from the meridian of the place from whence he began that course: I demaunde by what course the said Ships haue sailed, how far they bee a sunder, and by what course they may meete?

A The first ship hath sailed North west and by west, the second

## The Sea-mans Kalender.

round hath sailed north west and by north 169 leagues, they are a  
sunder 64 leagues, the course bet weene them is north north east.

**Q 8** Two shippes sailing from one place in the paralell of 60.  
degr. the one sailing 180. leagues eastwards, hath raised the pole  
5. degrees, I demaund vpon what course, and how many leagues  
the other ship shal saile to bring himself 50. leagues north by west  
from the first ship.

**A** The first ship hath sailed northeast and by east, and is de-  
parted from the Meridian 150 leagues. The second ship must  
saile northeast two degrees northerly, leagues 204 and is depar-  
ted from the Meridian where he began his course 140. leagues.

**Q 9** If I saile from the paralell of 50. degrees, 100. Leagues  
north, I demaund what lattitude I am in?

**A** In the lattitude of 55. degrees.

**Q 10** If I saile from the paralell of 50. degr south, till I lay  
the pole 5. degrees. I demaund how many leagues I haue sailede.

**A** 100. leagues.

**Q 11** If from Long. 22. degr. I saile in the paralell of 60. de-  
grees 100. leagues East. I demaunde what longitude I am in?

**A** In Longitude 32. degrees.

**Q 12** If from longitude 22. degrees, I saile in the paralel of 50  
degrees, to Longitude 30. degrees, I demaund how many  
leagues I haue sailed?

**A** Leagues 154.  $\frac{4}{7}$

**Q 13** If I saile from Longitude 20. degrees, and Latitude  
40. to longitude 350 degrees 27. min. and Latitude 30. degrees,  
I demaund the rumbe and distance?

**A** Course west south west, distance 62  $2\frac{7}{8}$ . leagues.

**Q 14** From long. 22 deg. and latitude 45. degrees, north east  
20. leagues, what longitude and latitude hath the second place?

**A** 23. degrees longitude, 45 degrees 42. minutes latitude.

**Q 15** From longitude 23. degrees, and latitude 45. degrees,  
42 minutes east and by north 30 leagues, what Longitude and  
latitude hath the second place?

**A** 25. degr. 9. min. longitude 45. degr. 59. min. latitude.

**Q 16** From Longitude 25. degr. 9. mi. & lati. 45. deg. 59. min.



## The Sea-mans Kalender.

east south east 25. leag. What longitude and latitude hath the second place?

A 26. degrees 53. minutes longitude, 45. degrees 31. minutes latitude.

Q 17. From longitude 26 degrees, 53. minutes, and latitude 45. degrees 31. minutes north 40. leagues, What longitude and latitude hath the second place?

A. Longitude 26. degrees 53. minutes, latitude 47. degrees 31. minutes.

Q 18. From longitude 26. degrees, 53. minutes, and latitude 47. degrees 31. min. 50. leagues west north west, What longitude and latitude hath the second place?

A Longitude 23. degrees 17. minutes, latitude 48. degrees 28. minutes.

Q 19. From longitude 23. degrees 17. minutes, and latitude 48. degrees 28. minutes East north east 60. leagues. What longitude and latitude hath the second place?

A Longitude 27. degrees 17. minutes. latitude 49. degrees, 36 minutes.

---

Here followeth a briefe Table of fines  
for Arethmeticall calculatiō, the totall fine wherof  
is 10000. with certain necessary propositiōs to be wrought  
*thereby, by which few thinges proposed, and the examples*  
thereto annexed, anye one that hath either an inge-  
nious spirit, or a willing minde to the practice  
of the Mathematicall Sciences, may at-  
taine to much knowledge  
therin.

*A briefe declaration of the same.*

**W**hat the Table of fines is, hath beene verie learnedly  
explained by others, and therefore needeles is it for mee  
to

## The Sea-mans Kalender.

to discourse thereof: onely take these few instructions for the help of those, which as yet haue no knowledge therein. First knowe that sailing, which is the principall thing heere aimed at, is performed by a true and perfitt knowledge of the Spheare, by the proiection wherof, all calculations, tables calculated, and instruments for obseruation are inuented, protracted, framed and made. What the Spheare is I neede not to discusse, the chiefe or great Circles thereof consisting of 360. degrees, and one quarter thereof being 90. degrees, which quarter being taken from the whole circumference, consisteth of these three particulars, viz. An arke or parte of a circle being indeede 90. degrees, or a quarter of the whole circle: a right angle, and two equall sides thereto, of which the one is y<sup>e</sup> base or ground line, y<sup>e</sup> other a perpendicular let fall thereon at right angles, the vtmoste endes or extensions of which two lines are the limmits of the foresaid arch, or quarter of a circle: the which three partes so fitted together in their due order, sheweth the perfitt platfome of one quarter of the whole Circle, commonly called a quadrant: the base or ground line whereof being diuided into 10000. equall partes, is sinus totus or the whole sine: and the whole arch or quarter of a Circle into 90. degrees, is the whole arke belonging to the saide whole sine.

Within which quadrant, any number of degrees or minutes counted from the beginning or first perpendicular, may be called an arke, or part of a circle: & another perpendicular let fall therefrom to the aforesaide base or groundline, the number of equall partes that the saide perpendicular falleth vpon, is the right signe to the arke giuen: and the complement of the arke giuen, is the remainder thereof, it being taken from 90. degrees or the whole quadrant. To finde out the right sine of any giuen arke, looke in the head of the Table following for the degrees thereof, and if there be any minutes therewith, looke for the minutes at the left side of the Table, and carrying your eye downeward from the degree, till you come right against the minutes, the number which you finde in the common angle to them both, is the right sine of your giuen arke desired: as if you desire the sine of 35. degrees 20. minutes, looke in the head of the Table for 35. and vpon

## The Sea-mans Kalender,

upon the left side thereof for 20. and in the common square or angle right against them both you shall finde 5783. which is the sine of 35. degrees 20 minutes, and if you substract 35 degrees 20 minutes from 90. degrees, the remainder 54. degrees 40. minutes is the complement thereof, whose right line (found as before is taught) is 8158. what the versed sine is, and how found out, is afterward shewed. I doubt not but y these few words will suffice for the explaining of the Table following, whose large and ample vles for navigation and other the mathematicall practises, these following exemplarie propositions, will in some reasonable sorte make manifest: by which few here proposed and answered, the ingenious may gather the manifold vles thereof, being that indeede the benefit to be reaped thereby is greater, and the propositions to be wrought thereby infinite.

### Certaine propositions to be wrought by the Table of sines.

The Sunnes true place being known, to finde his Declination. Prop. 1

**A**s the sine of the sunnes greatest declination is in proportion to the totall sine, so is the sine of the sunnes declination for the day proposed, to the sine of the sunnes distance from the nearest Equinoctiall point. Example.

I would knowe the declination of the sun the 1. of May 1610. at what time the true place of the sun being in 20 degr. 25 min. of Taurus, is 50 degr. 25 minu: from the beginning of Aries, or the vernal Equinoctiall point, therefore I must multiply the sine of 50 degr. 25 min: the suns distance from the Equinoctiall point by the sine of 23 degr 30 min, the greatest declination, and that product must be deuided by the whole sine, whose seuerall sines being found out in the table following, and set in order, the woork will stand thus:

If 90      giue 23,30      what 50,25

10000

3987

7707

Facit 3072, whose nearest arke 17,53 minu. is the true declination of the Sunne, the day and yeare aforesaid.

The



## The Sea-mans Kalender.

The Declination of the Sunne giuen to finde his place in the  
Zodiacke. Prop. 2

**A**s the whole sine is to the sine of the greatest declination, so is the Sun's place from the Equinoctiall point to the declination for the day proposed.

Example.

The first of May, 1610 I finde that the declination of the sun is 17 degr, 53 min north, therefore I say

If 23,30 giue 90 what 17,53

3987 10000 3072

Facit 7705 whose arke 50 degr. 24 minu, is the suns distance from the vernal equinoctiall point of Aries, from which taking 30 degr, the whole sine of Aries, the remainer 20, degr, 24. minutes shewes the sunne to be so much entred into Taurus, which is the next sine.

The latitude and declination of the Sunne giuen, to finde  
the amplitude. Pro. 3

**A**s the sine of the complement of the Latitude is in proportion to the whole sine, so is the sine of the sunnes declination to the amplitude.

Example

The 10 of Aprill, 1608 I desire the amplitude of the Sun, viz. how much the sun doth rise and set from the true east & west point of the Orizon towards the north or south in the latitude of 51 degrees 40 min: to know which, the worke is thus.

If 38 degr. 20 mi: the complement of the latitude giue 90 degr. the arke of the whole sine, what gines 11 degr. 43 min, the declination of the sunne:

38 degr. 20 min. 90 11:43 minutes,

6202 10000: 1859

Facit 2997 whose arke sought out in the Table of sines, is 16 degr. 26 mi: for the amplitude in the day, yere & place proposed: the same deuided by 11. the number of deg: that belongs to a point of the compasse, sheweth one point 5. deg. & 11 mi: which the sun riseth and sets to the northward of the east and west, being that the declination is north, for if the declination were south, then were the amplitude southerly.

The

## The Sea-mans Kalender,

The declination and amplitude of the Sunne giuen, to finde  
the height of the Pole.

Propo. 4.

**A**s the Sine of the amplitude is in proportion to the Sine of the Declination, so is the whole sine to the sine of the complement of the Latitude.

Example.

The Declination 11. degrees 43. minutes, and the amplitude 16. degrees 26. minutes. I demaund the height of the Pole: say

If 16.26		11.43		90
2997	giue	1859	what	10000

Facit 6202. whose arcke in the Table of sines being 38. Degr. 20. minutes, is the height of the Equinotiall, or the complement of the Latitude, that subtracted from 90. degrees, leaues 51. Degr. 40 minutes for the height of the Pole or Latitude of the place desired.

The true place and declination of the Sunne giuen, to  
finde the right ascention.

Pro. 5.

**A**s the sine of the complement of the declination is to the totall sine, so is the sine of the complement of the sunnes distance from the beginning of Aries, to the complement of the right ascention.

Example.

I desire the right ascention of the Sunne the 20. of April. 1609. being then in 10. degrees of Taurus, at which time his declination is 14. degrees 51. minutes. and the complement thereof 75. degrees 9. minutes, and the distance from the beginning of Aries 40 degrees, whose complement is 50. degrees. I say then

If 75. 9.		90.		50. Degr.
9667.	giue	10000.	what	7660

Facit

## The Sea-mans Kalender.

Facit. 7923. whose arke in the Table of sines is 52. degrees 24. minutes, the complement whereof 37. degrees 36. minutes, is the Sunnes right ascention: the same conuerted into houres by allowing 15 degrees to an houre, giues two houres and 30. mi.

This is to be vnderstood, when the Sunne is betwixt the beginning of Aries, and the tropicke of Cancer, so: if the Sunne be in the tropicke of Cancer, then is the right ascention 90 degrees or 6. houres: and if the Sun be betwixt the tropicke of Cancer and the Equinoctiall point, the distance that the Sun is from the beginning of Aries, out of 180. degr, and with the remainer worke as befoze so: the right ascention, which ascention is found, take from 180. and the remaine is the right ascention desired. But, if the sunne bee betwixt the Equinoctiall of Lybra, and the tropicke of Capricorne, subtract the saide distance from the beginning of Aries, out of 270 degrees, and if betwixt the tropicke of Capricorne, and the beginning of Aries, take the said distance out of 360. degrees, and then worke as befoze. One example or two will make all this plaine vnto you.

The last of June 1611. the true place of the Sunne 17. degrees 46. minutes of Cancer, is 107 degrees 46. minutes from the beginning of Aries, which taken from 180, leaues 72. degrees 14. minutes, whose complement is 17. degrees 46. minutes, the sunnes declination, then is 22. degrees 19. minu. the complement thereof 67. degrees 41. minutes. Say then

If 67.41 giue 90 what 17.46 minutes?

9251      10000      3051

Facit. 3298. whose ark is 19. deg 15. mi, the complement whereof 70. degr. 45. mi. taken frō 180 leaues 109. degr. 15. mi. so: the right ascention desired, which conuerted into hour. makes 7. ho. 17 min. Againe, I desire the right ascention of 20. degr. 40. min. of Capricornus, whose distance in continuall proceeding from the beginning of Aries, being 290. degrees 40. minutes taken from 360 leaues 69 degrees 20 minutes, with the complement whereof 20. degrees 40. minutes, and the complement of the declination of the sunne vpon the same point of the Sunnes place 68. degrees 6. minutes, I worke as followes.



# The Sea-mans Kalender.

If 68 6	giue 90	what 20.40?	
9212	10000	3529	

Facit 3830, whose arke is 22. degrees 31, minutes, the complement whereof 67, degrees 29, minutes taken from 360. leaues 292. degrees 31. minutes for the right ascension desired, the same conuerted into houres is 19. houres, 30. minutes.

The Latitude and Declination of the Sunne knowne, to finde the difference ascentionall.

## . Prop. 6

**A**s the sine of the complement of the Latitude is to the sine of the Latitude, so is the sine of the declination to the quotient found againe as the sine of the complement of the declination is to the whole sine, so is the saide quotient found to the difference ascentionall.

## Example.

I would knowe the difference ascentionall the 10. of May 1608. the Declination being then 20. degrees 6 minutes, and the Latitude 51 degrees 40. minutes, I say

If 38.20	giue 51.40.	what 20, 6.	
6202	7844.	3437	

Facit. 4346 for the quotient found, then againe I say

If 6,54	giue 90	what	
9391	10000	4346	

Facit. 2627 whose arke in the table of sines, 27. degrees 34 minuiues is the difference ascentional for the day proposed: y same reduced into houres and minutes makes one houre and 50. minutes, which taken from 6. a clocke, the houre that the Sun riseth, being in the Equinotiall, leaueth foure houres 10. minutes,

## The Sea-mans Kalender.

minutes, at what time the Sunne then riseth, and the saide ascensionall difference added to 6. a clocke, makes 7. a clocke, 50. minutes for the Sunne setting.

Againe, the saide ascensionall difference doubled and added to twelue houres, the time from 6. in the morning till 6. at night makes 15. houres 40. minutes for the whole length of the day.

This is when the Sunne hath north Declination, for if the Declination be south, then the ascensionall difference added to sixe a clocke, giues the Sunnes rising, and taken from 6, leaues the setting, and beeing doubled and taken from twelue houres, leaues the length of the day as aforesaid.

The amplitude and difference ascensionall of the  
Sunne or Starre giuen, to finde the  
Declination.

### Prop. 7

**A**s the sine of the time of the Sunne rising, conuerted into degrees and minutes, is to the sine of the complement of the amplitude, so is the whole sine to the sine of the complement of the Declination.

#### Example.

The difference ascensionall being 27. degrees 34. minutes, shewes the Sunne to rise at 4 a clocke 10. minutes, which conuerted into degrees makes 62. degrees 30 minutes, and the amplitude being found as before is shewed in the third Prop. is 33 degrees 38 minutes, and the complement thereof 56. degrees 22 minutes. Say then

As	62.30	giues	56.22	what	90
	8870		8326		10000

Facit. 9387 whose arke 69 degrees 50. minutes, the complement therof 20 degrees 10 minutes is the declination desired.

The

## The Sea-mans Kalender,

The Latitude and Declination giuen, to finde the Meridionall altitude.

### Prop. 8

**I**f the sunne haue north Declination, adde the complement of the Latitude with the declination, the product is the Meridionall altitude.

### Example.

If the Declination be 23. degrees 30. minutes, and the Latitude 51. degrees 40 minutes, the complement thereof 38 degrees 20 added with 23. 30 mi, makes 61 degrees 50 min. for the meridian altitude: but if the declination be 23 degrees 30 south, and the latitude 51 degrees 40 minutes, subtract 23 degrees 30 minutes the declination from 38 degrees 20 minutes, the complement of the Latitude, and the remainder 14 degrees 50 minutes is the altitude desired: and the sunne be in the equinoctiall, hauing no declination, then is the meridian Altitude equall to the complement of the Latitude.

The latitude and Declination known, to finde the height of the Sunne at any houre of the day.

### Prop: 9

**F**irst you are to consider whether the sunne be in the Equinoctiall, or whether he hath north or south declination, for if the sunne be in the Equinoctiall, then as the whole line is to the sine of the complement of the Latitude, so is the sine of the complement of the Sunnes distance from noone, allowing 15 degrees, for euery houre to the sine of the altitude desired.

### Example

The 10 of March 1608, the sunne then hauing no declination, the Latitude 51. degrees 40 minutes, I desire the Sunnes height at 9 a clocke before noone, or at 3 after noone, the complement of the latitude is 38. degrees 20 minutes, and the houres distance from noone, 45 degrees, whose complement is also 45 degrees. Say then.



## The Sea-mans Kalender.

If 90. giue 38.20. what 45  
 10000 6202 7071

Facit 43.85. whose ark 26. deg. is the height of the Sunne above the horizon, the time and place proposed.

If the Sunne haue declination, then is the working somewhat more tedious, except onely at 6. a clock, either before or after noone, for which houre, as the whole line is to the line of the Latitude, so is the line of the declination, to the line of the Altitude.

Example.

The 10 of Aprill 1608. the Latitude 51. deg. 40. min. and the declination 11. degrees 43. minutes. say

If 90. giue 51.40. what 43.00  
 10000 7844 2031

Facit 1583. whose ark 9. deg. 7. min. is the Altitude desired.

But for any other houre of the day if it be lesse then 6. hou. or 90. deg. worke as followes, multiply the line of the houres distance from noone by the line of the complement of the Latitude, the product diuided by the whole line, and the ark of the quotient taken from 90. set apart for the number first found, which number so found, compare with the Latitude, then multiply the whole line, by the line of the lesser, and diuide the product thereof by the line of the greater; and to the complement of the ark of the product adde the declination of the Sunne, if the declination be northerly or subtract, if the declination be southerly, and if the product or remaine be more then 90. deg. take it from 180. and the rest is the second found number, which 2. numbers so knowne.

As the whole line is to the number first found, so is the second found number to the Altitude desired.

Example.

The 10. of Aprill at 9. a clocke, the Latitude 51. deg. 40. min. the distance from noone 45. deg. and the declination 11. degrees 43. minuts, I desire the Sunnes hight: say

If 90. giue 38.20. what 45  
 10000 6202 7071

Facit 43.85, whose ark 26. deg. taken from 90. leaues 64. deg.

# The Sea-mans Kalender.

for the first found number, then comparing the Latitude, and it together, the latitude being the lesser, I multiply the whole line thereby, and deuide by the sine of the first found, saying,

If 64.0 give 51.40 what 90?  
8988 7844 10000

Facit 87.27. whose arke being 80. deg. 46. min. to the complement thereof 29. deg. 14. min. I add the declination 11. degrees 43. min. & the totall 40. deg. 57. min. is the second found number, which 2. numbers so knowne, say againe

If 90 give 64 what 40.57?  
10000 8988 6554

Facit 58.90. whose arke 36. deg. 54. min. is the Altitude of the Sunne desired.

Againe, if the houre for which you desire the Sunnes height, be more then 6. houres or 90. degrees from the meridian, you must substract the said distance from 180. and multiply the sine of the remainer, by the sine of the complement of the Latitude, which product being deuided by the whole line, the complement of the quotients arke is the first found number, the sine wherof compare with the sine of the Latitude, multiplying the whole sine by the lesser, and deuiding the product by the greater, from the arke of which quotient, if you take the complement of the declination, you haue the second found number, the sine whereof multiplied by the sine of the first found, and the product deuided by the totall line, the quotients arke is the Altitude desired.

## Example.

The 16. of Aprill at 5. in the morning, the Latitude 51. 40. min. the houres distance from noone 7. or 105. deg. which deducted from 180. leaues 75. deg. for the hou. distance, say then

If 90 give 38.20 what 75.0?  
10000 6202 9659

Facit 59.90. whose arke being 36. deg. 48. min. the complement thereof 53. 12. is the first found number: say then againe,

If 53.12 give 51.40 what 90?  
8007 7844 10000

Facit 97.56. from whose arke 78. deg. 25. min. taking 78. deg. 17. min.

## The Sea-mans Kalender.

17 min. the complement of the Sunnes declination, rests 8. min.  
for the second found number, which 2. numbers so found, say

If	50.	giue	53.12	what	0.8
	10000		8007		0 23

Facit 17. whose atke 6. min. is the height of the Sunne above the horizon at 5. in the morning or 7. in the evening, the day and time aforesaid.

The Latitude given to finde how many minutes or miles of the Equinoctiall, make a degree of Longitude in any Paralell Pro. 10

**A**s the whole line is in proportion to 60. so is the line of the complement of the Lat. to the miles answerable to a deg. in the Lat desired. Example.

I desire to know how many miles in running east or west in the Latitude of 51. deg. 40. min. will alter one deg. of Long: say

If	90	giue	60	what	38.20
	10000				6202

Facit 37. for the number of miles, answerable to a deg. in the Latitude desired.

The course and distance given to finde out the difference of Latitude. Prop. 11.

**A**s the whole line is to the miles of way runne, so is the line of the courses dist. from east or west to the min. of difference of Latitude. Example:

Running west south west, which is 22. deg. 30. min. from the west, 75. leag. or 225. miles, I demaund the difference of Latitude: say

If	90	giue	225	what	22.30
	10000				3827

Facit 85. mi. or one deg. 25. min. for the difference of Lat. upon the said course and distance.

By course and distance given to finde the difference of Longitude. Propo. 12

**A**s the whole line is to the miles of way that you haue run, so is the line of the deg. that your course is distant from south or north to the miles that you are departed from your first meri.

3 2

Example



## The Sea-mans Kalender.

for the first found number, then comparing the Latitude, and it together, the latitude being the lesser, I multiply the whole sine there by, and deuide by the sine of the first found, saying,

If 64.0 giue 51.40 what 90?  
8988 7844 10000

Facit 8727. whose arke being 80. deg. 46. mi. to the complement thereof 29. deg. 14. min. I adde the declination 11. degrees 43. min. & the totall 40. deg. 57. min. is the second found number, which 2. numbers so knowne, say againe

If 90 giue 64 what 40.57?  
10000 8988 6554

Facit 5890. whose arke 36. deg. 54. min. is the Altitude of the Sunne desired.

Againe, if the houre for which you desire the Sunnes height, be more then 6. houres or 90. degrees from the meridian, you must subtract the said distance from 180. and multiply the sine of the remainer, by the sine of the complement of the Latitude, which product being deuided by the whole sine, the complement of the quotients arke is the first found number, the sine wherof compare with the sine of the Latitude, multiplying the whole sine by the lesser, and deuiding the product by the greater, from the arke of which quotient, if you take the complement of the declination, you haue the second found number, the sine whereof multiplied by the sine of the first found, and the product deuided by the totall sine, the quotients arke is the Altitude desired.

### Example.

The 10. of Aprill at 5. in the morning, the Latitude 51. 40. min. the houres distance from noone 7. or 105. deg. which deduced from 180. leaues 75. deg. for the hou. distance, say then

If 90 giue 38.20 what 75.0?  
10000 6202 9659

Facit 5990. whose arke being 36. deg. 48. min. the complement thereof 53. 12. is the first found number: say then againe,

If 53.12 giue 51.40 what 90?  
8007 7844 10000

Facit 9756. from whose arke 78. deg. 35. min. taking 78. deg. 17. min.

## The Sea-mans Kalender.

17 min. the complement of the Sunnes declination, rests 8. min.  
for the second found number, which 2. numbers so found, say

If	90.	giue	53.12	what	0.8
	10000		8007		0 23

Facit 17. whose arke 6. min. is the height of the Sunne above the horizon at 5. in the morning or 7. in the evening, the day and time aforesaid.

The Latitude given to finde how many minutes or miles of the Equinoctiall, make a degree of Longitude in any Paralell Pro. 10

**A**s the whole line is in proportion to 60. so is the sine of the complement of the Lat. to the miles answerable to a deg. in the Lat. desired. Example.

I desire to know how many miles in running east or west in the Latitude of 51. deg. 40. min. will alter one deg. of Long: say

If	90	giue	60	what	38.20
	10000				6202

Facit 37. for the number of miles, answerable to a deg. in the Latitude desired.

The course and distance given to finde out the difference of Latitude. Prop. 11.

**A**s the whole line is to the miles of way runne, so is the sine of the courses dist. from east or west to the sin. of difference of Latitude. Example:

Running west south west, which is 22. deg. 30. min. from the west, 75. leag. or 225. miles, I demaund the difference of Latitude: say

If	90	giue	225	what	22.30
	10000				3827

Facit 85. mi. or one deg. 25. min. for the difference of Lat. upon the said course and distance.

By course and distance given to finde the difference of Longitude. Propo. 12

**A**s the whole line is to the miles of way that you haue run, so is the sine of the deg. that your course is distant from south or north to the miles that you are departed from your first meri.

I 2

Example

# The Sea-mans Kalender,

## Example.

Running northwest and by north which is 33:deg: 45: min:  
from the north 60: leag: or 180: miles, I demaund the difference  
of longitude: say

If 90. give 180 what 33.45  
10000

Facit 100. miles which you are departed from the meridian to  
the westward: which if you deuide by the number of miles an-  
swerable to a deg: of longitude, in the latitude where you then  
finde your selfe to be the quotient, giues you the deg. and min. of  
the difference in longitude.

By distance, and departure from the Meridian giuen  
to finde the course. Prop. 13

**A**s the miles of distance, that you haue runne, is in propor-  
tion to the whole sine, so is the miles of your departure from  
the meridian to the sine of your course from south or north.

## Example:

Being departed from my first meridian 75. miles in the run-  
ning of 50: leagues, or 150: miles, I demaund vpon what  
point I haue sailed, it being betwixt south and west: say

If 150 give 10000 what 75?

Facit 5000 whose ark 30:deg: is the distance from south to  
wards west, that the course is which is south west and by south  
southerly:

The Latitude, declination, and height of the Sunne,  
giuen to knowe the hour of the day:

## Proposition. 14:

**A**dde the complement of the Latitude, and the declination to-  
gether, and from the sine of the totall, substract the sine of the  
Altitude obserued, the remainer is your number first found,  
which number first found, multiply by the whole sine, and de-  
uide by the sine of y complement of the Latitude, the quotient,  
wherof is y second found number, which secōd nūber so known,  
as the sine of the complement of the declination is to the totall  
sine, so is the said second found number to the quotient, which  
quotient taken from the whole sine, the complement of the ark  
to the



## The Sea-mans Kalender.

to the remainer, is the Sunnes distance from noone in deg. and minutes:

### Example.

The 15 of May the declination 21. deg. 4. min. and the complement of the Latitude 38. deg. 20. min. added together, is 59. deg. 24. min. the sine thereof 8607. the height of the Sun observed 48. deg. 30. min. the sine thereof 7490. the which taken from the former number, leaues 1117. for the first found number, then I say,

If	38.20	give	90	what
	6202		10000	1117

Fait 1801. for the second found number, againe say:

If	68.56	give	90.	what
	9332		10000	1801

Facit 15. which taken from 10000. leaues 8671. whose ark 53. deg. 49. min. subtracted from 90. leaues 36. deg. 11. min. for the Sunnes distance from the meridian: that conuerted into houres, is 2. houres 24. min. from noone when the Sunne is so high as aforesaid.

To finde the Sinus versus of any giuen arke.

### Proposition. 15.

If the ark giuen, be lesse then 90. subtract it from 90. and the sine of the remainer taken from the totall sine leaues the sinus versus, but if the giuen ark be greater then 90. deg: Subtract 90. deg. there from and seeke the sine of the remainer, which is alwayes the complement of the giuen ark, which sinus adde to the whole sine, and the totall thereof is the sinus versus, of the giuen ark desired.

### Example.

To know the sinus versus, of 47. deg. 12. mi. the complement thereof is 42. deg. 48. min. whose sine 6794 taken from 10000 the whole sine resteth 3206. the reuerfed sine of 47. deg. 12. min.

Likewise to knowe the reuerfed sine of 137. degrees 25. min. which is more then 90. deg. taking 90. therefrom, there resteth 47. degrees 25. minutes, the sinus whereof 7363. added to the whole sine, maketh 17363. for the reuerfed sine of 137 degrees 25. minutes.

# A Table

## The Degrees of the Quadrant.

mi.	0	1	2	3	4	5	6	7	8	9
1	3	177	352	526	700	874	1048	1222	1395	1567
2	6	180	355	529	703	877	1051	1224	1398	1570
3	9	183	358	532	706	880	1054	1227	1400	1573
4	12	186	361	535	709	883	1057	1230	1403	1576
5	14	189	363	538	712	886	1060	1233	1406	1579
6	17	192	366	541	715	889	1063	1236	1409	1582
7	20	195	369	544	718	892	1065	1239	1412	1584
8	23	198	372	547	721	895	1068	1242	1415	1587
9	26	201	375	549	724	898	1071	1245	1418	1590
10	29	204	378	552	727	900	1074	1247	1421	1593
11	32	206	381	555	729	903	1077	1250	1424	1596
12	35	209	384	558	732	906	1080	1253	1426	1599
13	38	212	387	561	735	909	1083	1256	1429	1602
14	41	215	390	564	738	912	1086	1259	1432	1605
15	44	218	393	567	741	915	1089	1262	1435	1608
16	46	221	395	570	744	918	1091	1265	1438	1610
17	49	224	398	573	747	921	1094	1268	1441	1613
18	52	227	401	576	750	924	1097	1271	1444	1616
19	55	230	404	578	753	927	1100	1273	1446	1619
20	58	233	407	581	756	930	1103	1276	1449	1622
21	61	235	410	584	758	932	1106	1279	1452	1625
22	64	238	413	587	761	935	1109	1282	1455	1627
23	67	241	416	590	764	938	1112	1285	1458	1630
24	70	244	419	593	767	941	1115	1288	1461	1633
25	73	247	422	596	770	944	1118	1291	1464	1636
26	76	250	425	599	773	947	1120	1294	1467	1639
27	78	253	427	602	776	950	1123	1297	1469	1642
28	81	255	430	605	779	953	1126	1299	1472	1645
29	84	259	433	608	782	956	1129	1302	1475	1648
30	87	262	436	610	785	958	1132	1305	1478	1650

# of Sines.

## The Degrees of the Quadrant,

mi	0	1	2	3	4	5	6	7	8	9
31	90	265	439	613	787	961	1135	1308	1481	1653
32	93	268	442	616	790	964	1138	1311	1484	1656
33	96	270	445	619	793	967	1141	1314	1487	1659
34	99	273	448	622	796	970	1144	1317	1490	1662
35	102	276	451	625	799	973	1146	1320	1492	1665
36	105	279	454	628	802	976	1149	1322	1495	1668
37	107	282	456	631	805	979	1152	1325	1498	1670
38	110	285	459	634	808	982	1155	1328	1501	1673
39	113	288	462	637	811	985	1158	1331	1504	1676
40	116	291	465	640	814	987	1161	1334	1507	1679
41	119	294	468	642	816	990	1164	1337	1510	1682
42	122	297	471	645	819	993	1167	1340	1513	1685
43	125	300	474	648	822	996	1170	1343	1515	1688
44	128	302	477	651	825	999	1172	1346	1518	1691
45	131	305	480	654	828	1002	1175	1348	1521	1693
46	134	308	483	657	831	1005	1178	1351	1524	1696
47	137	311	485	660	834	1008	1181	1354	1527	1699
48	140	314	488	663	837	1011	1184	1357	1530	1702
49	142	317	491	666	840	1013	1187	1360	1533	1705
50	145	320	494	668	843	1016	1190	1363	1536	1708
51	148	323	497	671	845	1019	1193	1366	1538	1711
52	151	326	500	674	848	1022	1196	1369	1541	1714
53	154	329	503	677	851	1025	1198	1372	1544	1716
54	157	331	506	680	854	1028	1201	1374	1547	1719
55	160	334	509	683	857	1031	1204	1377	1550	1722
56	163	337	512	686	860	1034	1207	1380	1553	1725
57	166	340	515	689	863	1037	1210	1383	1556	1728
58	170	343	517	692	866	1039	1213	1386	1559	1731
59	172	347	520	695	869	1042	1216	1389	1561	1734
60	174	350	523	697	871	1045	1219	1392	1564	1736



# A Table

## The Degrees of the Quadrant.

mi	10	11	12	13	14	15	16	17	18	19
1	1739	1911	2082	2252	2422	2591	2759	2926	3093	3258
2	1742	1914	2085	2255	2425	2594	2762	2929	3096	3261
3	1745	1917	2088	2258	2428	2597	2765	2932	3098	3264
4	1747	1919	2090	2261	2430	2599	2767	2935	3101	3267
5	1750	1922	2093	2264	2433	2602	2770	2938	3104	3269
6	1753	1925	2096	2267	2436	2605	2773	2940	3107	3272
7	1756	1928	2099	2269	2439	2608	2776	2943	3109	3275
8	1759	1931	2102	2272	2442	2611	2779	2946	3112	3278
9	1762	1934	2105	2275	2445	2613	2781	2949	3115	3280
10	1765	1937	2107	2278	2447	2616	2784	2951	3118	3283
11	1767	1939	2110	2281	2450	2619	2787	2954	3120	3286
12	1770	1942	2113	2283	2453	2622	2790	2957	3123	3289
13	1773	1945	2116	2286	2456	2625	2793	2960	3126	3291
14	1776	1948	2119	2289	2459	2628	2795	2963	3129	3294
15	1779	1951	2122	2292	2462	2630	2798	2965	3132	3297
16	1782	1954	2125	2295	2464	2633	2801	2968	3134	3300
17	1785	1957	2127	2298	2467	2636	2804	2971	3137	3302
18	1788	1959	2130	2300	2470	2639	2807	2974	3140	3305
19	1790	1962	2133	2303	2473	2641	2809	2976	3143	3308
20	1793	1965	2136	2306	2476	2644	2812	2979	3146	3311
21	1796	1968	2139	2309	2478	2647	2815	2982	3148	3313
22	1799	1971	2142	2312	2481	2650	2818	2985	3151	3316
23	1802	1974	2145	2315	2484	2653	2821	2988	3154	3319
24	1805	1977	2147	2317	2487	2655	2823	2990	3156	3322
25	1808	1979	2150	2320	2490	2658	2826	2993	3159	3324
26	1810	1982	2153	2323	2492	2661	2829	2996	3162	3327
27	1813	1985	2156	2326	2495	2664	2832	2999	3165	3330
28	1816	1988	2159	2329	2498	2667	2835	3001	3167	3332
29	1819	1991	2161	2331	2501	2669	2837	3004	3170	3335
30	1822	1994	2164	2334	2504	2672	2840	3007	3173	3338

# of Sines.

## The Degrees of the Quadrant.

mi	10	11	12	13	14	15	16	17	18	19
31	1825	1996	2167	2337	2507	2675	2843	3010	3176	3341
32	1828	1999	2170	2340	2509	2678	2846	3013	3178	3343
33	1830	2002	2173	2343	2512	2681	2848	3015	3181	3346
34	1833	2005	2176	2346	2515	2683	2851	3018	3184	3349
35	1835	2008	2178	2349	2518	2686	2854	3021	3187	3352
36	1839	2011	2181	2351	2521	2689	2857	3024	3189	3354
37	1842	2014	2184	2354	2524	2692	2860	3026	3192	3357
38	1845	2016	2187	2357	2526	2695	2862	3029	3195	3360
39	1848	2019	2190	2360	2529	2698	2865	3032	3198	3363
40	1850	2022	2193	2363	2532	2700	2868	3035	3201	3365
41	1853	2025	2196	2365	2535	2703	2871	3037	3203	3368
42	1856	2028	2198	2368	2538	2706	2874	3040	3206	3371
43	1859	2031	2201	2371	2540	2709	2876	3043	3209	3374
44	1862	2034	2204	2374	2543	2712	2879	3046	3212	3376
45	1865	2036	2207	2377	2546	2714	2882	3049	3214	3379
46	1868	2039	2210	2380	2549	2717	2885	3051	3217	3382
47	1870	2042	2213	2382	2552	2720	2887	3054	3220	3385
48	1873	2045	2216	2385	2555	2723	2890	3057	3223	3387
49	1876	2048	2218	2388	2557	2726	2893	3060	3225	3390
50	1879	2051	2221	2391	2560	2728	2896	3062	3228	3393
51	1882	2053	2224	2394	2563	2731	2899	3065	3231	3396
52	1885	2056	2227	2397	2566	2733	2901	3068	3234	3398
53	1888	2059	2230	2399	2568	2737	2904	3072	3236	3401
54	1891	2062	2232	2402	2571	2740	2907	3074	3239	3404
55	1894	2065	2235	2405	2574	2742	2910	3076	3242	3406
56	1896	2068	2238	2408	2577	2745	2913	3079	3245	3409
57	1899	2070	2241	2411	2580	2748	2915	3082	3247	3412
58	1902	2073	2244	2414	2583	2751	2918	3085	3250	3415
59	1905	2076	2247	2416	2585	2754	2921	3087	3253	3417
60	1908	2079	2249	2419	2588	2756	2924	3090	3256	3420

# A Table

## The Degrees of the Quadrant.

mi	20	21	22	23	24	25	26	27	28	29
1	3423	3586	3749	3910	4070	4229	4386	4542	4697	4851
2	3426	3589	3751	3913	4073	4231	4389	4545	4700	4853
3	3428	3592	3754	3915	4075	4234	4391	4548	4702	4856
4	3431	3594	3757	3918	4078	4237	4394	4550	4705	4858
5	3434	3597	3759	3921	4081	4239	4396	4553	4707	4861
6	3437	3600	3762	3923	4083	4242	4399	4555	4710	4863
7	3439	3603	3765	3926	4086	4245	4402	4558	4713	4866
8	3442	3605	3768	3929	4089	4247	4404	4561	4715	4868
9	3445	3608	3770	3931	4091	4250	4407	4563	4718	4871
10	3447	3611	3773	3934	4094	4252	4410	4566	4720	4873
11	3450	3613	3776	3937	4096	4255	4412	4568	4723	4876
12	3453	3616	3778	3939	4099	4258	4415	4571	4725	4878
13	3456	3619	3781	3942	4102	4260	4418	4573	4728	4881
14	3458	3622	3784	3945	4104	4263	4420	4576	4731	4883
15	3461	3624	3786	3947	4107	4266	4423	4579	4733	4886
16	3464	3627	3789	3950	4110	4268	4425	4581	4736	4888
17	3467	3630	3792	3953	4112	4271	4428	4584	4738	4891
18	3469	3632	3794	3955	4115	4274	4431	4586	4741	4893
19	3472	3635	3797	3958	4118	4276	4433	4589	4743	4896
20	3475	3638	3800	3961	4120	4279	4436	4592	4746	4898
21	3477	3641	3803	3963	4123	4281	4438	4594	4748	4901
22	3480	3643	3805	3966	4126	4284	4441	4597	4751	4904
23	3483	3646	3808	3969	4128	4287	4444	4599	4754	4906
24	3486	3649	3811	3971	4131	4289	4446	4602	4756	4909
25	3488	3651	3813	3974	4134	4292	4449	4604	4759	4911
26	3491	3654	3816	3977	4136	4295	4451	4607	4761	4914
27	3494	3657	3819	3979	4139	4297	4454	4610	4764	4916
28	3497	3660	3821	3982	4142	4300	4457	4612	4766	4919
29	3499	3662	3824	3985	4144	4302	4459	4615	4769	4921
30	3502	3655	3827	3987	4147	4305	4462	4617	4771	4924



# of Sines.

## The Degrees of the Quadrant:

mi	20	21	22	23	24	25	26	27	28	29
31	3505	3668	3829	3990	4149	4308	4464	4620	4774	4927
32	3507	3670	3832	3993	4152	4310	4467	4623	4777	4929
33	3510	3673	3835	3995	4155	4313	4470	4625	4779	4932
34	3513	3676	3837	3998	4157	4316	4472	4628	4782	4934
35	3516	3679	3840	4001	4160	4318	4475	4630	4784	4937
36	3518	3681	3843	4003	4163	4321	4478	4633	4787	4939
37	3521	3684	3846	4006	4165	4324	4480	4635	4789	4942
38	3524	3687	3848	4009	4168	4326	4483	4638	4792	4944
39	3527	3689	3851	4011	4171	4329	4485	4641	4794	4947
40	3529	3692	3854	4014	4173	4331	4488	4643	4797	4949
41	3532	3695	3856	4017	4176	4334	4490	4646	4799	4952
42	3535	3697	3859	4019	4178	4336	4493	4648	4802	4954
43	3537	3700	3862	4022	4181	4338	4496	4651	4805	4957
44	3540	3703	3864	4025	4184	4342	4498	4653	4807	4960
45	3543	3706	3867	4028	4186	4344	4501	4656	4810	4962
46	3546	3708	3870	4030	4189	4347	4503	4659	4812	4965
47	3548	3711	3872	4033	4192	4350	4506	4661	4815	4967
48	3551	3714	3875	4035	4194	4352	4509	4664	4817	4970
49	3554	3716	3878	4038	4197	4355	4511	4666	4820	4972
50	3556	3719	3880	4041	4200	4357	4514	4669	4822	4975
51	3559	3722	3883	4043	4202	4360	4516	4671	4825	4977
52	3562	3724	3886	4046	4205	4363	4519	4674	4828	4980
53	3565	3727	3888	4049	4208	4365	4522	4677	4830	4982
54	3567	3730	3891	4051	4210	4368	4524	4679	4833	4985
55	3570	3732	3894	4054	4213	4371	4527	4682	4835	4987
56	3573	3735	3896	4057	4216	4373	4529	4684	4838	4990
57	3575	3738	3899	4059	4218	4376	4532	4687	4840	4992
58	3578	3741	3902	4062	4221	4378	4535	4689	4843	4995
59	3581	3743	3905	4065	4224	4381	4537	4692	4845	4997
60	3584	3746	3907	4067	4226	4384	4540	4695	4848	5000

# A Table

## The Degrees of the Quadrant.

mi	30	31	32	33	34	35	36	37
1	5002	5153	5302	5449	5594	5738	5880	6020
2	5005	5155	5304	5451	5597	5740	5882	6023
3	5007	5158	5306	5454	5599	5743	5885	6025
4	5010	5160	5309	5456	5601	5745	5887	6027
5	5012	5163	5311	5458	5604	5748	5890	6030
6	5015	5165	5314	5461	5606	5750	5892	6032
7	5017	5168	5316	5463	5609	5752	5894	6034
8	5020	5170	5319	5466	5611	5755	5896	6037
9	5022	5173	5321	5468	5614	5757	5899	6039
10	5025	5175	5324	5471	5616	5759	5901	6041
11	5027	5178	5326	5473	5618	5762	5904	6044
12	5030	5180	5329	5476	5621	5764	5906	6046
13	5032	5183	5331	5478	5623	5767	5908	6048
14	5035	5185	5334	5480	5625	5769	5911	6051
15	5037	5188	5336	5483	5628	5771	5913	6053
16	5040	5190	5339	5485	5630	5774	5915	6055
17	5042	5193	5341	5488	5633	5776	5918	6057
18	5045	5195	5343	5490	5635	5778	5920	6060
19	5048	5198	5346	5493	5638	5781	5922	6062
20	5050	5200	5348	5495	5640	5783	5925	6064
21	5053	5203	5351	5497	5642	5785	5927	6067
22	5055	5205	5353	5500	5645	5788	5929	6069
23	5058	5208	5356	5502	5647	5790	5932	6071
24	5060	5210	5358	5505	5650	5793	5934	6074
25	5063	5212	5361	5507	5652	5795	5936	6076
26	5065	5215	5363	5509	5654	5797	5939	6078
27	5068	5217	5366	5512	5657	5800	5941	6081
28	5070	5220	5368	5514	5659	5802	5943	6083
29	5073	5222	5370	5517	5662	5805	5946	6085
30	5075	5225	5373	5519	5664	5807	5948	6088

# *of the Sines.*

## The Degrees of the Quadrant.

mi	30	31	32	33	34	35	36	37
31	5078	5227	5375	5522	5666	5809	5950	6090
32	5080	5230	5378	5524	5669	5812	5953	6092
33	5083	5232	5380	5527	5671	5814	5955	6094
34	5085	5235	5383	5529	5674	5816	5957	6097
35	5088	5237	5385	5531	5676	5819	5960	6099
36	5090	5240	5388	5534	5678	5821	5962	6101
37	5093	5242	5390	5536	5681	5823	5964	6104
38	5095	5245	5393	5539	5683	5826	5967	6106
39	5098	5247	5395	5541	5685	5828	5969	6108
40	5100	5250	5397	5543	5688	5831	5971	6111
41	5103	5252	5400	5546	5690	5833	5974	6113
42	5105	5255	5402	5548	5693	5835	5976	6115
43	5108	5257	5405	5551	5695	5838	5978	6117
44	5110	5260	5407	5553	5697	5840	5981	6120
45	5113	5262	5410	5556	5700	5842	5983	6122
46	5115	5265	5412	5558	5702	5845	5985	6124
47	5118	5267	5415	5560	5705	5847	5988	6127
48	5120	5269	5417	5563	5707	5849	5990	6129
49	5123	5272	5419	5565	5709	5852	5992	6131
50	5127	5274	5422	5568	5712	5854	5995	6134
51	5128	5277	5424	5570	5714	5856	5997	6136
52	5130	5279	5427	5573	5717	5859	5999	6138
53	5133	5282	5429	5575	5719	5861	6002	6140
54	5135	5284	5432	5577	5721	5864	6004	6143
55	5138	5287	5434	5580	5724	5866	6006	6145
56	5140	5289	5437	5582	5726	5868	6009	6147
57	5143	5292	5439	5585	5729	8871	6011	6149
58	5145	5294	5441	5587	5731	5873	6013	6152
59	5148	5297	5444	5589	5733	5875	6016	6154
60	5150	5299	5446	5592	5736	5878	6018	6156



# A Table

## The degrees of the Quadrant

mi	38	39	40	41	42	43	44	54
1	6159	6295	6430	6563	6694	6822	6949	7073
2	6161	6298	6432	6565	6696	6824	6951	7075
3	6163	6300	6434	6567	6698	6826	6953	7077
4	6166	6302	6437	6569	6700	6828	6955	7079
5	6168	6304	6439	6571	6702	6831	6957	7081
6	6170	6307	6441	6574	6704	6833	6959	7083
7	6173	6309	6443	6576	6706	6835	6961	7085
8	6175	6311	6446	6578	6708	6837	6963	7087
9	6177	6313	6448	6580	6711	6839	6965	7089
10	6179	6316	6450	6582	6713	6841	6967	7092
11	6182	6318	6452	6585	6715	6843	6969	7094
12	6184	6320	6454	6587	6717	6845	6972	7096
13	6186	6322	6457	6589	6719	6847	6974	7098
14	6189	6325	6459	6591	6721	6850	6976	7100
15	6191	6327	6461	6593	6724	6852	6978	7102
16	6193	6329	6463	6596	6726	6854	6980	7104
17	6195	6331	6466	6598	6728	6856	6982	7106
18	6198	6334	6468	6600	6730	6858	6984	7108
19	6200	6336	6470	6602	6732	6860	6986	7110
20	6202	6338	6472	6604	6734	6862	6988	7112
21	6205	6340	6474	6606	6736	6864	6990	7114
22	6207	6343	6477	6609	6738	6867	6992	7116
23	6209	6345	6479	6611	6741	6869	6994	7118
24	6211	6347	6481	6613	6743	6871	6997	7120
25	6214	6349	6483	6615	6745	6873	6999	7122
26	6216	6352	6486	6617	6747	6875	7001	7124
27	6218	6354	6488	6620	6749	6877	7003	7126
28	6220	6356	6490	6622	6752	6879	7005	7128
29	6223	6358	6492	6624	6754	6881	7007	7130
30	6225	6361	6494	6626	6756	6883	7009	7132

# of Sines.

## The Degrees of the Quadrant.

mi	38	39	40	41	42	43	44	45
31	6227	6363	6497	6628	6758	6886	7011	7134
32	6230	6365	6499	6630	6760	6888	7013	7136
33	6232	6367	6501	6633	6762	6890	7015	7139
34	6234	6370	6503	6635	6764	6892	7017	7141
35	6236	6372	6505	6637	6766	6894	7019	7143
36	6239	6374	6508	6639	6769	6896	7021	7145
37	6241	6376	6510	6641	6771	6898	7023	7147
38	6243	6379	6512	6644	6773	6900	7026	7149
39	6245	6381	6514	6646	6775	6902	7028	7151
40	6248	6383	6516	6648	6777	6905	7030	7153
41	6250	6385	6519	6650	6779	6907	7032	7155
42	6252	6387	6521	6652	6781	6909	7034	7157
43	6255	6390	6523	6654	6783	6911	7036	7159
44	6257	6392	6525	6657	6786	6913	7038	7161
45	6259	6394	6527	6659	6788	6915	7040	7163
46	6261	6396	6530	6661	6790	6917	7042	7165
47	6264	6399	6532	6663	6792	6919	7044	7167
48	6266	6401	6534	6665	6794	6921	7046	7169
49	6268	6403	6536	6667	6796	6923	7048	7171
50	6270	6405	6539	6670	6799	6925	7050	7173
51	6273	6408	6541	6672	6801	6928	7052	7175
52	6275	6410	6543	6674	6803	6930	7054	7177
53	6277	6412	6545	6676	6805	6932	7057	7179
54	6279	6414	6547	6678	6807	6934	7059	7181
55	6282	6417	6550	6680	6809	6936	7061	7183
56	6284	6419	6552	6683	6811	6938	7063	7185
57	6286	6421	6554	6685	6813	6940	7065	7187
58	6289	6423	6556	6687	6816	6942	7067	7189
59	6291	6426	6558	6689	6818	6944	7069	7191
60	6293	6428	6560	6691	6820	6946	7071	7193

# A Table

## The Degrees of the Quadrant.

mi	46	47	48	49	50	51	52	53
1	7195	7315	7433	7549	7662	7773	7882	7988
2	7197	7317	7435	7551	7664	7775	7884	7990
3	7199	7319	7437	7553	7666	7777	7885	7992
4	7201	7321	7439	7555	7668	7779	7887	7993
5	7203	7323	7441	7557	7670	7781	7889	7995
6	7205	7325	7443	7559	7672	7782	7891	7997
7	7207	7327	7445	7560	7673	7784	7893	7998
8	7209	7329	7447	7562	7675	7786	7894	8000
9	7211	7331	7449	7564	7677	7788	7896	8002
10	7213	7333	7451	7566	7679	7790	7898	8004
11	7215	7335	7453	7568	7681	7791	7900	8005
12	7218	7337	7455	7570	7683	7793	7901	8007
13	7220	7339	7457	7572	7685	7795	7903	8009
14	7222	7341	7459	7574	7687	7797	7905	8011
15	7224	7343	7461	7576	7688	7799	7907	8012
16	7226	7345	7463	7577	7690	7801	7909	8014
17	7228	7347	7464	7579	7692	7803	7910	8016
18	7230	7349	7466	7581	7694	7804	7912	8018
19	7232	7351	7468	7583	7696	7806	7914	8019
20	7234	7353	7470	7585	7698	7808	7916	8021
21	7236	7355	7472	7587	7700	7810	7918	8023
22	7238	7357	7474	7589	7701	7811	7919	8025
23	7240	7359	7476	7591	7703	7813	7921	8026
24	7242	7361	7478	7593	7705	7815	7923	8028
25	7244	7363	7480	7595	7707	7817	7925	8030
26	7246	7365	7482	7596	7709	7819	7926	8032
27	7248	7367	7484	7598	7711	7821	7928	8033
28	7250	7369	7486	7600	7712	7822	7930	8035
29	7252	7371	7488	7602	7714	7824	7932	8037
30	7254	7373	7490	7604	7716	7826	7933	8038



# of Sines.

## The Degrees of the Quadrant:

mi	46	47	48	49	50	51	52	53
31	7256	7375	7491	7606	7718	7828	7935	8040
32	7258	7377	7493	7608	7720	7830	7937	8042
33	7260	7379	7495	7610	7722	7832	7939	8044
34	7262	7381	7497	7612	7724	7833	7941	8045
35	7264	7382	7499	7614	7725	7835	7942	8047
36	7266	7384	7501	7615	7727	7837	7944	8049
37	7268	7386	7503	7617	7729	7839	7946	8051
38	7270	7388	7505	7619	7731	7840	7948	8052
39	7272	7390	7507	7621	7733	7842	7949	8054
40	7274	7392	7509	7623	7735	7844	7951	8056
41	7276	7394	7511	7625	7737	7846	7953	8058
42	7278	7396	7513	7627	7739	7848	7955	8059
43	7280	7398	7514	7629	7740	7849	7956	8061
44	7282	7400	7516	7630	7742	7851	7958	8063
45	7284	7402	7518	7632	7744	7853	7960	8064
46	7286	7404	7520	7634	7746	7855	7962	8066
47	7288	7406	7522	7636	7748	7857	7963	8068
48	7290	7408	7524	7638	7750	7858	7965	8070
49	7292	7410	7526	7640	7751	7860	7967	8071
50	7294	7412	7528	7642	7753	7862	7969	8073
51	7296	7414	7530	7644	7755	7864	7970	8075
52	7298	7416	7532	7645	7757	7866	7972	8076
53	7300	7418	7534	7647	7759	7867	7974	8078
54	7302	7420	7536	7649	7760	7869	7976	8080
55	7304	7422	7537	7651	7762	7871	7977	8082
56	7305	7424	7539	7653	7764	7873	7979	8083
57	7307	7426	7541	7655	7766	7875	7981	8085
58	7309	7428	7543	7657	7768	7876	7983	8087
59	7311	7430	7545	7658	7770	7878	7985	8088
60	7313	7431	7547	7660	7771	7880	7986	8090

# *A Table*

## The degrees of the Quadrant

mi	54	55	56	57	58	59	60
1	8092	8193	8292	8388	8482	8573	8662
2	8094	8195	8294	8390	8483	8575	8663
3	8095	8197	8295	8391	8485	8576	8665
4	8097	8198	8297	8393	8487	8578	8666
5	8099	8200	8298	8395	8489	8579	8668
6	8100	8201	8300	8396	8490	8581	8669
7	8102	8203	8302	8398	8491	8582	8670
8	8104	8205	8303	8399	8493	8584	8672
9	8105	8206	8305	8401	8494	8585	8673
10	8107	8208	8307	8402	8496	8587	8675
11	8109	8210	8308	8404	8497	8588	8676
12	8111	8212	8310	8406	8499	8590	8678
13	8112	8213	8311	8407	8500	8591	8679
14	8114	8215	8313	8409	8502	8593	8681
15	8116	8216	8315	8410	8503	8594	8682
16	8117	8218	8316	8412	8504	8596	8684
17	8119	8220	8318	8414	8506	8597	8685
18	8121	8221	8319	8415	8507	8599	8687
19	8122	8223	8321	8417	8509	8600	8688
20	8124	8225	8323	8418	8511	8602	8690
21	8126	8226	8324	8420	8513	8603	8691
22	8128	8228	8326	8421	8514	8605	8692
23	8129	8230	8328	8423	8516	8606	8694
24	8131	8231	8329	8424	8517	8607	8695
25	8133	8233	8331	8426	8519	8608	8597
26	8134	8235	8332	8428	8520	8610	8698
27	8136	8236	8334	8429	8522	8612	8699
28	8138	8238	8336	8431	8523	8613	8701
29	8139	8240	8337	8432	8525	8615	8702
30	8141	8241	8339	8434	8526	8616	8704

# of Sines.

## The Degrees of the Quadrant:

mi	54	55	56	57	58	59	60
31	8143	8243	8340	8435	8528	8618	8705
32	8144	8245	8342	8437	8529	8619	8706
33	8146	8246	8344	8438	8531	8621	8708
34	8148	8248	8345	8440	8532	8622	8709
35	8149	8249	8347	8442	8535	8623	8711
36	8151	8251	8348	8443	8536	8625	8712
37	8153	8253	8350	8445	8537	8627	8713
38	8155	8254	8352	8446	8539	8628	8715
39	8156	8256	8353	8448	8540	8630	8716
40	8158	8257	8355	8449	8542	8631	8718
41	8160	8259	8356	8451	8543	8633	8719
42	8161	8261	8358	8452	8545	8634	8721
43	8163	8263	8360	8454	8546	8636	8722
44	8165	8264	8361	8455	8548	8637	8724
45	8166	8266	8363	8457	8549	8638	8725
46	8168	8267	8364	8458	8551	8640	8726
47	8170	8269	8366	8460	8552	8641	8728
48	8171	8271	8367	8462	8554	8643	8729
49	8173	8272	8369	8463	8555	8644	8731
50	8175	8274	8371	8465	8557	8646	8732
51	8176	8276	8372	8466	8558	8647	8733
52	8178	8277	8374	8468	8560	8649	8735
53	8180	8279	8375	8470	8561	8650	8736
54	8181	8281	8377	8471	8563	8652	8738
55	8183	8282	8379	8473	8564	8653	8739
56	8185	8284	8380	8474	8566	8654	8740
57	8186	8285	8382	8476	8567	8656	8742
58	8188	8287	8383	8477	8569	8657	8743
59	8190	8289	8385	8479	8570	8659	8745
60	8191	8290	8387	8480	8572	8660	8746



# A Table

## The Degrees of the Quadrant,

mi	61	62	63	64	65	66	67
2	8749	8832	8913	8990	9065	9138	9207
4	8752	8835	8915	8993	9068	9140	9209
6	8755	8838	8918	8995	9070	9142	9212
8	8758	8841	8921	8998	9073	9145	9214
10	8760	8843	8923	9000	9075	9147	9216
12	8763	8846	8926	9003	9078	9149	9218
14	8766	8849	8928	9006	9080	9152	9221
16	8769	8852	8931	9008	9083	9154	9223
18	8771	8854	8934	9011	9085	9156	9225
20	8774	8857	8936	9013	9087	9159	9228
22	8777	8860	8939	9016	9090	9161	9230
24	8780	8862	8941	9018	9092	9164	9232
26	8783	8865	8944	9021	9095	9166	9234
28	8785	8867	8947	9023	9097	9168	9236
30	8788	8870	8949	9026	9100	9171	9239
32	8791	8873	8952	9028	9102	9173	9241
34	8794	8875	8954	9031	9104	9175	9243
36	8796	8878	8957	9033	9107	9177	9245
38	8799	8880	8960	9036	9109	9180	9247
40	8802	8883	8962	9038	9112	9182	9250
42	8805	8886	8965	9041	9114	9184	9252
44	8808	8889	8967	9043	9116	9187	9254
46	8810	8891	8970	9046	9119	9189	9256
48	8813	8894	8972	9048	9121	9191	9259
50	8816	8897	8975	9051	9123	9194	9261
52	8819	8899	8978	9053	9126	9196	9263
54	8821	8902	8980	9056	9128	9198	9265
56	8824	8905	8983	9058	9131	9200	9267
58	8827	8907	8985	9061	9133	9203	9270
60	8830	8910	8988	9063	9135	9205	9272

# of Sines.

## The Degrees of the Quadrant,

mi	68	69	70	71	72	73	74
2	9274	9338	9399	9457	9512	9565	9614
4	9276	9340	9401	9459	9514	9566	9616
6	9278	9342	9403	9461	9516	9568	9617
8	9280	9344	9405	9463	9518	9570	9619
10	9283	9346	9407	9465	9519	9571	9620
12	9285	9348	9409	9466	9521	9573	9622
14	9287	9350	9411	9468	9523	9575	9624
16	9289	9352	9413	9470	9525	9576	9625
18	9291	9354	9415	9472	9527	9578	9627
20	9293	9356	9417	9474	9528	9580	9628
22	9296	9358	9419	9476	9530	9581	9630
24	9298	9360	9420	9478	9532	9583	9632
26	9300	9363	9422	9480	9534	9585	9633
28	9302	9365	9424	9481	9535	9586	9635
30	9304	9367	9426	9483	9537	9588	9636
32	9306	9369	9428	9485	9539	9590	9638
34	9308	9371	9430	9487	9540	9591	9639
36	9310	9373	9432	9489	9542	9593	9641
38	9313	9375	9434	9491	9544	9595	9642
40	9315	9377	9436	9492	9546	9596	9644
42	9317	9379	9438	9494	9548	9598	9645
44	9319	9381	9440	9496	9549	9600	9647
46	9321	9383	9442	9498	9551	9601	9648
48	9323	9385	9444	9500	9553	9603	9650
50	9325	9387	9446	9501	9554	9604	9651
52	9327	9389	9447	9503	9556	9606	9653
54	9329	9391	9449	9505	9558	9608	9655
56	9332	9393	9451	9507	9559	9609	9656
58	9334	9395	9453	9509	9561	9611	9658
60	9336	9397	9455	9510	9563	9613	9659

# A Table

## The degrees of the Quadrant

mi	75	76	77	78	79	80	81	82
5	9663	9706	9747	9784	9819	9850	9879	9905
10	9667	9710	9750	9787	9822	9853	9881	9907
15	9670	9713	9753	9790	9824	9855	9884	9909
20	9674	9717	9755	9793	9827	9858	9886	9911
25	9678	9720	9760	9796	9830	9860	9888	9912
30	9681	9724	9763	9799	9832	9863	9890	9914
35	9685	9727	9766	9802	9835	9865	9892	9916
40	9689	9730	9769	9805	9838	9868	9894	9918
45	9692	9734	9772	9808	9840	9870	9896	9920
50	9696	9737	9775	9811	9843	9872	9898	9922
55	9699	9740	9778	9813	9846	9874	9900	9924
60	9703	9744	9781	9816	9848	9877	9903	9925

## Degrees of the Quadrant.

mi	83	84	85	86	87	88	89
5	9927	9947	9963	9977	9987	9994	9998
10	9929	9948	9964	9978	9988	9995	9998
15	9931	9950	9965	9978	9988	9995	9998
20	9932	9951	9967	9979	9989	9996	9999
25	9934	9952	9968	9980	9990	9996	9999
30	9936	9954	9969	9981	9990	9996	9999
35	9937	9955	9970	9982	9991	9997	99
40	9939	9957	9971	9983	9992	9997	99
45	9940	9958	9972	9984	9992	9998	99
50	9942	9959	9973	9984	9993	9998	99
55	9944	9960	9975	9985	9993	9998	99
60	9945	9962	9976	9986	9994	9998	10000 10000

The





## *The Extraction of rootes.*

**I**t is not vnnecessarie, before we doe enter into the order & methode of teaching, how to extract a roote to shew the diuers kindes & their disinations: therefore you must know that of roots there are sundrie sortes, according to the quantities from which they are deriued, as  $\sqrt{\quad}$  Squares,  $\sqrt[3]{\quad}$  Cubes, squared squares, sardfoides, &c. for the numbers receiue their names of the said quantities, every quantitie hauing his roote which may be called the first quantitie because it is the side or beginning of the quantitie hereunto it is set: numbers of the second quantitie are called, squares of the third cubes, of the fourth squared squares as before: wherein you may proceede infinitely, if you wil but you shall sildome or neuer haue vse, for the extraction of the roote of any quantitie more then squares and Cubes: A square number is the product of any number multiplied in it selfe, & the roote therof is the multiplier wherby the same square number is produced, as for example, 4 is the square number comming of the multiplication of 2. in it selfe, which is the roote thereof

A Cubicke number is the product of any number multiplied into it selfe, and the same product multiplied againe by the first into it selfe, and the same product multiplied againe by the first number: as 2. multiplied by it selfe is 4 that product multiplied againe by 2. the first number makes 8 which is a Cubicke number, and the roote there of is 2.

A squared square number, is produced of 4. multiplications: first any number by it selfe makes a square number, that product againe by the first roote or multiplier, makes a Cubicke nūber & lastly

## The Extraction of rootes.

lastly that product againe by the first number or roote, produceth a squared square nūber, as 2. multiplied in it self makes 4. a square number, that againe by 2. makes 8. which is a Cubicke number & then that product againe by 2. produceth 16. which is a squared square number: and the roote therof is 2. A surd solide number is the product of any number multiplied five times by the roote thereof: as 32 is a surd solide number, y<sup>e</sup> roote wherof is 2. for 2. multiplied in it selfe is 4 that multiplied againe by 2 is 8. the same product againe by 2 makes 16. & lastly the same product multiplied by the first number 2 makes 32. therfore I conclude that 32. is a surd solide nūber, & the number 2 wherby the saide number is produced, is the surd solide roote to the said number: and thus multiplying the last product by the first number or roote, you may proceede infinitely, but more then these are needles, and as I said before, without any greate or common vse.

Now for the finding of the roote, it must bee done according to the quantitie wherof it taketh the denomination, as whether it be of a square or Cube, or otherwise: which known, let vs proceede to the working therof.

You mu. I vnderstand that the order of extracting the roote of any quantitie, is not much vnlike to deuision, differing onely in this, that wheras in diuision the deuisor is known, but here it is to finde. also in diuision you alwaies keep on deuisor, but in this you must change your deuisor at each remoouing, which is at y<sup>e</sup> finding of euerie figure contained in the roote: now therefore I wil lay down one generall way for the extraction of the roote of all quantities whatsoeuer, which is done by certaine numbers applied to each seuerall quantitie, which are these: for y<sup>e</sup> square roote is one number required, which is 20. For the Cube 2 nūbers, which are 300. & 30. For the squared square 3 nūbers. viz. 4000. 600. & 40.

Thus hauing declared the kindes, numbers, quantities, and order of the extraction of all sortes of rootes, it followeth that wee proceede to the practise therof: And first for to extract the square roote of any number, you must consider as before I haue said, that 20. is the number for the same quantitie: also you must learne by memorie the  
iust

## The Extraction of rootes.

inſt ſquare of all  $\sqrt{9}$  vnities, which if you know not, this  
 Table will ſtād you in ſome ſteed: where you ſee that a  
 gainſt euerie of the nine vnities aforeſaide towards the  
 right hād is  $\sqrt{}$  ſquare of that vnitie againſt which it doth  
 ſtand: which knowne, ſet downe the nūber wherof you  
 would extract  $\sqrt{}$  ſquare root, the vnder  $\sqrt{}$  laſt figure, at  $\sqrt{}$   
 right hand, put a prick, & then proceeding towards the  
 left hād vnder euerie ſecond figure put a prick, that doon  
 draw with your pen a quotient as in deuifiō: ſo ſo for to  
 finde the root of your giuen nūber, ſeek the greateſt ſquare num-  
 ber contained in the number ouer the firſt prick, that ſquare nū-  
 ber take from the number ouer the ſaid firſt prick, & ſet the re-  
 mainer ouer it, the root of which ſquare number put in  $\sqrt{}$  quotient  
 for the firſt number of the roote: that roote multiply by 20. the  
 number for the ſquare roote, and looke how often the product  
 thereof may be taken from the number ouer the ſecond prick,  
 which put in your quotient for the ſecond number of your roote,  
 but this is to be noted for a general rule,  $\sqrt{}$  you muſt take no grea-  
 ter number for your ſecond figure, then that the ſquare thereof ad-  
 ded with the former product, may be taken from the number ouer  
 the ſaid ſecond prick: & alſo look how many pricks are vnder your  
 giuen nūber, ſo many figures muſt be in  $\sqrt{}$  quotient for the roote of  
 $\sqrt{}$  ſaid nūber: then hauing found two figures in the quotient, if there  
 be any more pricks, multiply the whole number in the quotient  
 by 20. & ſeek how often the product thereof may be taken from  
 the number ouer the next prick, which number put in the quoti-  
 ent, & adding  $\sqrt{}$  ſquare thereof to the former product, ſubſtract the  
 whole ſumme from the number ouer the ſaid prick, and cancel-  
 ling the ſaid number as at each remooue you muſt doe, ſet the re-  
 mainer ouer it, and if there bee any more pricks vndone, doe as  
 you did before alwaies multiplying the quotient by 20. thereto  
 adding the ſquare of the laſt figure, & the totall ſumme being ſub-  
 ſtracted from the laſt remainer, if there reſt nothing, it is a ſquare  
 number or elſe not, which you may prooue, if you multiply the  
 roote by it ſelfe ſquarely, for the roote being truly extracted, will  
 produce  $\sqrt{}$  firſt giuen number. But becauſe that examples are ea-  
 ſieſt



## The Extraction of rootes.

Next for the understanding, let 104976. be the given nūber w<sup>h</sup>erof  
 I would know y<sup>e</sup> square roote, viz. what num. being multiplied  
 into it selfe, wil produce y<sup>e</sup> aforesaid num. of 104976. Therefore  
 first, I set down the said nū. & vnder the last figure towards the  
 right hand, which in this example is 6. I put a prick or point, an-  
 other vnder 9. & lastly, another vnder 0. leauing one figure be-  
 twixt euery prick: which done & the quotient d<sup>i</sup>u<sup>i</sup>den, the given  
 num. will stand thus: 104976 whereby I see that y<sup>e</sup> root of the said  
 num. must consist of 3. figures, because it hath 3. pricks vnder it:  
 the I seek the greatest square num. in 10 it being the num. belo-  
 ing to the first prick towards the left hand, y<sup>e</sup> I find to be 9. which  
 is produced of 3. multiplied squarely, therfore I put 3. in y<sup>e</sup> quoti-  
 ent for the first figure of the root, and the square therof being 9. I  
 subtract from 10. the num. ouer y<sup>e</sup> first prick, & there rests 1. The  
 order of which worke will stand thus: 1.                      where you see  
 that y<sup>e</sup> figures ouer y<sup>e</sup> first prick being 104976 | 3 cancelled, there  
 is 3. in y<sup>e</sup> quotient for the first figure of 9.                      the root and 1.  
 rests, which w<sup>h</sup> the figures betwixt it                      & y<sup>e</sup> next prick,  
 makes 149. for the num. of the second prick. Now for the second  
 figure of y<sup>e</sup> root, I multiply 3. the roote already found by 20 & the  
 product is 60. that I seek how often I may take frō 149. the nū.  
 ouer the second prick, which I may do 2. times, for 2. times 60. is  
 120. wherunto y<sup>e</sup> square of 2. which is 4. being added, make 124.  
 that subtracted frō 149. leaues 25. therfore I put 2. in y<sup>e</sup> quotient  
 for the second figure of the root, & cancelling the 125  
 figures ouer the second prick, the remainder be- 104976 | 32.  
 ing put ouer it, the working thereof wil stād in 9  
 this order: where you see y<sup>e</sup> the quotient is 32. 124                      20  
 for the 2. first figures of the root, & the figures                      3  
 of the 2. first pricks being cancelled, there rests                      60  
 25. which with the other figures betwixt thē &                      2  
 the third & last prick makes 2576. for the num.                      120  
 ouer the last prick: now therfore, to finde the                      4  
 last figure of the root, I multiply the root alrea-                      124  
 dy found, that is to say 32. by 20. & the product  
 therof is 640. that I seek how oft it may be ta-

## The Extraction of rootes.

ken out of 2576. the number ouer the last prick,  
which may be done foure times, for foure times  
640. is 2560. whereunto if I adde the square  
of 4. there will amount 2576. which because it  
may be taken from the number remayning ouer  
the last pricke, I put 4. in the quotient for the last  
figure of the roote, and subtracting the former  
product of 2576. from the number ouer the last  
prick, which is likewise 2576. there will rest no-  
thing, therfore I cancell those figures likewise,  
and thereby conclude 104976. to bee a Square  
number, & 324. to bee the roote thereof: the prooffe  
whereof is by multiplying y<sup>e</sup> root into it selfe squa-  
rely: for if you multiply 324. by 324. y<sup>e</sup> first giuen  
number of 104976. will be produced, the worke  
ing whereof will be as aboue you may see.

This Example in my minde, might be suffi-  
cient with often vse & practise to bring perfecti-  
on in this kinde of Extractions, because that al-  
though the somme be neuer so great, it is done al-  
by one maner of worke: yet neuerthelesse, if I  
did not think that thou wouldest complaine ra-  
ther of tediousnes of learning, then of the diffi-  
culty in teaching, I wold giue another example,  
for variety of examples makes the worke sieme  
the more easie: therfore once againe, let 5487.  
30625 bee a giuen number, whereof I wold  
know the square roote: first I put prickes or  
points vnder the giuen number in such order as  
you see, beginning at the last figure to wards the  
right hand, & proceeding to wards the left, leauing one figure vn-  
pointed betwixt euery prick. where you see that the whole giuen  
nuber consists of 5. prickes, therfore of so many figures must your  
Roote or quotient bee: then drawing a quotient, I seeke  
the greatest square nuber in 5. which is the number ouer y<sup>e</sup> first  
prick, which greatest square number I finde to be 4. & the roote  
thereof

$$\begin{array}{r}
 128 \\
 104976 \overline{) 324} \\
 \underline{9} \\
 124 \\
 \underline{2576} \\
 32 \\
 \underline{20} \\
 640 \\
 \underline{4} \\
 2560 \\
 \underline{16} \\
 2576 \\
 \underline{324} \\
 324 \\
 \underline{1296} \\
 648 \\
 \underline{972} \\
 104976
 \end{array}$$

# The Extraction of rootes.

thereof 2, for two times two is foure, therefore I put 2 in the quotient and taking 4. the Square thereof from 5. the nūber over the first prick, there wil rest 1 which I set ouer 5 cancelling the said 5 the working whercof will stand as a-  
 boue, then for the second figure of the  $548730625|2$   
 Roote I multiplie 2 the first figure of the roote already founde by 20. and the product is 40. that I seek how oft it may be taken from 148 the number remaining ouer the second prick, which may be done 3 times, for 3 times 40 is 120. whereunto the square of 3 being added makes 129. the I put 3 in the quotient for the second figure of the roote, & subtracting 129. the last product from 148. the number remaining ouer the second prick there will rest 19 which with the other figures betwixt them and the next prick, makes 1973. therefore I cancel 148. and setting the remainer ouer it, I haue 1973. for the number ouer the third prick, and 23 in the quotient for the 2 first figures of the roote: now for the third figure of the roote I multiplie 23 the roote already found by 20 the product is 460. which may be taken from 1973. the number remaining ouer the third prick foure times, for 460. multiplied by 4. makes 1840. whereunto adding 16 the square of 4 the product is 1856, therefore I put 4. in the quotient for the third figure of the roote, & subtracting 1856 from 19734. the number ouer the third prick, there will remaine 117. which w<sup>th</sup> the other figures betwixt them & the next prick, makes 11706 for the number ouer the fourth prick, and there is in the quotient 2345

$$\begin{array}{r} 20 \\ 2 \\ \hline 40 \\ 3 \\ \hline 120 \\ 9 \\ \hline 129 \end{array}$$

$$\begin{array}{r} 19 \\ 548730625|23 \\ 4 \\ \hline 129 \\ 23 \\ 20 \\ \hline 460 \\ 4 \\ \hline 1840 \\ 16 \\ \hline 1856 \end{array}$$

$$\begin{array}{r} 1 \\ 11706 \\ 548730625|234 \end{array}$$

for



# The Extraction of rootes.

for the roote already found, the whole worke standing as above: Again for to finde the fourth figure of the roote, I multiply 234 the roote found by 20. & product wherof is 4680. which may be take out of 11706. two times, for 4680. multiplied by 2. makes 9360. which with 4. & square of 2. makes in all 9364 the same being subtracted from 11706. the number remaining over the 4. prick, there wil rest 2342. which w<sup>th</sup> the other figures betwixt them and the 5. or last prick, makes 234225. for the number remaining over the last pricke: therefore making my subtraction, I set the remainder over it. & put 2. in the quotient for the fourth figure of the roote as you may see in the margine: then to finde the last figure of the roote of this given numb. aforesaid, I multiply the whole roote already found viz. 2342. by 20. & product is 46840. which may be taken from 234225. the number over the last pricke 5. times for 46840. multiplied by 5. makes 234200. whereunto if I adde 25. the square of 5. the whole product will be 234225. which number is equal to the number over & last pricke, therefore I put 5. in the quotient, for the last figure of the roote, & subtracting the whole summe of the last product viz. 234225. from the number over the last point or prick, which is likewise 234225. there wil remaine nothing: wherby I finde 548730625. the given number to be a square number, and the roote thereof to be 23425. which is the number found out in the quotient as in this working therof you may more plainely perceiue.

I	
11717	
548730625	234
4	
129	
1856	234
	20
	<hr/>
	4680
	2
	<hr/>
	9360
	4
	<hr/>
	9364
X23	
11717	
548730625	2342
4	
129	
1856	
9364	2342
	20
	<hr/>
	46840
	5
	<hr/>
	234200
	25
	<hr/>
	234225

# The Sea-mans Kalender.

For prooffe wherof, if you multiply  
 $23425$ . the roote squarely into it self,  
 the product therof will be equall to the  
 first giuen number, as in this example  
 you may see.

I doubt not but to any indifferēt co-  
 ceit these two examples will suffice al-  
 well as if I shold contriue a whole vo-  
 lume therof, when it is so, that the gi-  
 uen number is a right iquare number,  
 but if y<sup>e</sup> giuen number be not a square  
 number, it is vnpossible for to finde an  
 exact roote therto, but that after the  
 worke, there will remaine something  
 as a fraction, or part of a nūber more  
 to be added to the quotient: for the true  
 & perfect valuation of which fraction  
 or remainer, none as yet could attain,  
 but they haue set down so neere alway  
 for the extraction of the roote of any  
 number not being a square number, that therby no greate error  
 may be perceiued: For the knowledge and better vnderstanding  
 of which, let this bee a familiar example: you knowe that  $16$ . is a  
 right square nūber, & the square root therof is  $4$ . but if you wold  
 extract the square roote of  $18$ , you shold haue  $4$ . in your quotient  
 likewise for the roote thereof: but then there will rest  $2$ . wher-  
 by you see that  $18$ . is no square number, neither can you knowe  
 what fraction to make of it by reason that you haue no certaine  
 deuisor, which might stand for denominator to the numerator, or  
 remainer: onely let this suffice, that to finde the nearest roote  
 therto, the rule is thus: double the remainer for the numerator &  
 quaduple viz. multiply the roote by  $4$ . and therto adde one for  
 denominator to the said numerator, as  
 in this example to extract the nearest  
 square roote of  $18$ . I finde  $4$ . to be in y<sup>e</sup>  
 quotient, &  $2$ . remaining, which  $2$ . be-

$$\begin{array}{r}
 23425 \\
 \times 23425 \\
 \hline
 117125 \\
 46850 \\
 93700 \\
 70275 \\
 46850 \\
 \hline
 548730625
 \end{array}$$

$$\begin{array}{r}
 2 \\
 18 \overline{) 4} 2 \\
 16 \\
 \hline
 2
 \end{array}$$

ing

## An extraction of rootes.

ing doubled, makes 4. for the numerator, and 4. the roote being multiplied by 4. makes 16. and one added therewith, makes 17. for denominator, whereby I say  $\frac{4}{17}$  is the nearest square roote of 18. which may be found out, for if you reduce  $\frac{4}{17}$  into one common denomination & then multiply them squarely, the product will be  $17\frac{1}{17}$  which is but  $\frac{1}{17}$  too little.

Thus having declared the order how to extract the square roote of any number: it resteth now that I shew the manner of extracting the Cuberoote of any number: as for the principal uses thereof, they shall be set downe heere after each in his particuler place as in working conclusions, their use shall be required.

To finde out the Cube roote of a giuen number, being a right Cnbe number, First put down the giuen number, and as in the square nuber you put points or pricks, beginning at the right hand & so towards the left, leauing betwixt each point one figure void, so in the extractiō of the roote of a Cube number, you must leaue two figures void or vnprickt betwixt every point, and as in the square root, so likewise in this: looke how many points are vnder the giuen number, so many figures must be contained in the roote thereof, which is also to be obserued in extracting the roote of any quantitie whatsoeuer. These things being considered, it is also necessarie, that you know the greatest Cubicke number of euerie of the 9. vnities, wherof the Table here vnder specified maketh explanation: where you see that against each vnitie, standeth the Cube number thereof, which being known, and the giuen number prickt, with a quotient drawne as before I haue shewed, to extract the Cube roote, you haue two numbers, viz. 300. & 30. but because the declaration of the working thereof would be too long to expresse in tearmes, let 13824. be a giuen number whereof I would extract the Cube roote. First I put downe the number aforesaid, with points vnder it, and a quotient in this order, 13824. | where by I see that the roote thereof must consist of two figures, because so many pointes dooth belong

1 . . . .	1
2 . . . .	8
3 . . . .	27
4 . . . .	64
5 . . . .	125
6 . . . .	216
7 . . . .	343
8 . . . .	512
9 . . . .	729

vnto



## The Extraction of rootes.

Unto the giuen number, for the first figure whereof I seeke the greatest Cube number contained in 13. & number ouer the first point towards & left hand, which I finde to bee 8. the Cube roote thereof which is 2. I put in the quotient for the first figure of the roote, and subtracting 8, from 13 restes 5. which I put ouer 13. cancelling the said 13. which done, the worke will be as aboue.

Now for to finde the 2. figure of the roote, I set downe the 2. numbers which serueth for the extraction of the Cube roote: viz. 300. 30. and against 30. I put the roote already found which is 2, and against 300, the square thereof which is 4, these 2. figures I set towards the left hand of them, then I multiplie 300. by 4. the figure which standeth against it, and the product is 1200. that I seeke how often I may take from 5824. & number ouer the 2. prick, which I may doe 4. times, therefore I put 4. in the quotient, for the second figure, & upon the right hand against 300. I set 4 the last found number in the quotient, and against 30. I put 16. the square thereof, and underneath 30. I put 64. which is & Cube of 4. then multiplying all the figures which are in a rowe into one product, viz. 4 by 300. makes 1200. & & againe by 4. makes 4800. for that product: the for the next, 2. by 30. makes 60. & that

$$\begin{array}{r}
 5 \\
 \times 3824 \overline{) 13} \\
 \underline{8} \\
 5 \\
 4. \quad 300. \quad 4. \\
 2. \quad 30. \quad .16 \\
 \underline{64} \qquad \qquad 300 \\
 \qquad \qquad \underline{4} \\
 30. \qquad \qquad \underline{1200} \\
 \qquad \underline{2} \qquad \qquad \underline{4} \\
 60 \qquad \qquad \underline{4800} \\
 \underline{16} \\
 360 \\
 \underline{60} \\
 960 \qquad \qquad 4800 \\
 \qquad \qquad \underline{960} \\
 \qquad \qquad \underline{64} \\
 \qquad \qquad \underline{5824}
 \end{array}$$

by 16. makes 960. for & second product, which I set downe together, each vnder other: lastly because 64. hath no other number to be multiplied therewith, I put that downe vnder them, which done, I adde them altogether, and the totall summe is 5824 the same subtracted from & number ouer the last prick, leaueth nothing, whereby I see that 13824. is a Cubicke number, and the square

## The Extraction of roots.

Cube roote thereof is 24. as you may  
more plainly see by the working ther-  
of, which is put in the margine above,  
where you see that 24. being multi-  
plied into it selfe, and that product a-  
gaine by 24 the first multiplier, the pro-  
duct is 13824. which is equall to the  
first given number.

$$24 \times 24 = 576$$

$$576 \times 24 = 13824$$

$$24$$

$$24$$

$$96$$

$$48$$

$$576$$

$$24$$

$$2304$$

$$1152$$

$$13824$$

Againe, seeing that examples are the  
easiest Methode of teaching & playnest  
for vnderstandeng, let 12551868224  
bee a given number, whereof I  
would extract the Cube roote: first ha-  
ving prickt it & drawn a quotient for the  
roote thus 12551868224 | I see  
that the roote must consist of foure fi-  
gures, so many pricks being vnder  
the given number: for the finding of which figures, I seeke  
first the greatest Cube number in 12. which is 8. the roote whereof  
being 2. I put in the quotient for the first figure of the roote, & sub-  
strating 8. the Cube thereof from 12. the  
number ouer the first prick rests 4. then  
for the second figure of the Roote I put  
down 300. & 30. the numbers for the cube  
root: against 30. I set 2. & roots found,  
and against 300. 4 the square thereof, &  
multiplying 300. by 4. the product is 1200. that may be taken  
out of 4551. the number ouer the second prick 3. times, therefore  
I put 3. in the quotient, and likewise after 300. & the square there-  
of which is 9. after 30. & the cube thereof which is 27. I put vnder  
30. then I multiply all the numbers in the first rowe each by the o-  
ther, viz. 4. by 300. makes 1200. & the same product againe by 3.  
makes 3600. which I set by it self: then againe I multiply 2. by 30  
is 60. & that again by 9. makes 540. which I put vnder y other pro-  
duct: lastly, because 27. hath no number where with to be multi-

$$12551868224 \div 23 = 545733$$

$$8$$

$$4$$

$$2$$

$$1$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

# The Extraction of Rootes.

plied, I set it down likewise under both the other, & 3. 3600  
 numbers being set in order one under another as you 540  
 see, I ad them also together, & the whole product is 4167. 27  
 the same I subtract from 451, the number over the 4167  
 next pücke, & there will remaine 384. to ioine with the number o-  
 uer the 3. pücke: which done, the worke wil stand in this order as  
 you see. Now, for the third figure of the 4384  
 roote, I put downe 300. & 30. as before, & a- 12551868224 | 23:  
 gainst 30. at the left hand put 23. the roote 8  
 already found, & against 300. the square ther- 4167  
 of which is 529. then multiplying 529. by 300. the product is 158700. which may bee  
 likewise taken from 384868. therfore I put 2 529. 300  
 in the quotient for the 3. figure of the roote, & likewise put 2. to the 23. 30  
 right hand of 300. & the square therof which is 4. at the right had of 30. and the Cube therof being 8, I put under 30. which numbers  
 wil stand as aboue: then multiplying all the numbers in one rowe  
 each by ether into one product, viz. 529. by 529 300. 2  
 300. makes 158700. & that againe by 2 is 23 30. 4  
 317400. for the whole product of that rowe 8  
 which I set downe by it selfe, then I mul- 317400.  
 tiplie 23. by 30. is 690. & that againe by 4 is 2760  
 2760. for the product of the second rowe. 8

Lastly, because 8 hath no numb. with it, 320168  
 I put it downe under the other, & then ad- 6  
 ding all the 3. summes together, the pro- 4384700  
 duct is 320168. the same taken from 12551868224  
 384868. the number over the third pücke, 8 232  
 rests for the number over the last pücke, 4167  
 64700224. and in the quotient is 320168  
 232. the whole worke being as yen see  
 aboue. Now for to finde the fourth and last figure of the Roote,  
 I put downe the two numbers againe which serue for the Cube  
 roote, viz. 300. & 30. at the left hand of 30. I put 232. the number in  
 the quotient and at the left hand of 300. I set the Square of 232.  
 which is 53824. in this order: Then 53824 300  
 multiplying 53824. by 300 the 232 30  
 Product



# The Extraction of Roores,

Product is 16147200. which I seeke how often maye bee had in 64700224. the numbers remaining ouer the last prick that may be done foure times, therfore I put 4 in 53824...300...4 the quotient for the fourth and last figure 232...30...16 of the roote & also I set the said 4 at the right hand of 300 and the Square thereof which is 16. at the right hand of 30. & y cub. thereof being 64. I put right vnderneath 30. which done, al y numb. wil stand as aboue : Then multiplying all the num. in each rowe into their seueral products viz. 53824. by 300. makes 16147200. y that againe by 4 is 64588800. which I set by it selfe: then againe 232. by 30. is 6960. the same product by 16. makes 111360. which I put downe vnder the other : Lastly, because 64. hath no other number to be multiplied therewith, I put it downe likewise vnder the other 2. numbers, and adding the these products together, the whole Summe thereof will be 64700224. which being subtracted from the number remaining ouer the last pricke, leaues nothing, so haue I in the quotient 2324. for the Cube roote : of 12551868224. the given number, the whole worke whereof is here set downe in the margin : For the prooffe whereof, if you multiplie the Roote: viz. 2324. Cubickly in it selfe, the product thereof will be equall with the first given number as in this example. Where you see that 2324. the roote being multiplied into it selfe squarely, and then likewise, the whole product thereof againe by the same roote 2324. the totall Summe amounting therof, is 12551868224. the first given number.

$$\begin{array}{r}
 53824 \dots 300 \dots 4 \\
 232 \dots 30 \dots 16 \\
 64 \\
 64588800 \\
 111360 \\
 64 \\
 \hline
 64700224 \\
 53824 \text{ by } 300 \text{ makes } 16147200 \\
 \text{y that againe by } 4 \text{ is } 64588800 \\
 \text{which I set by it selfe: then againe } 232 \text{ by } 30 \text{ is } 6960 \\
 \text{the same product by } 16 \text{ makes } 111360 \\
 \text{which I put downe vnder the other} \\
 4384700 \\
 12551868224 \\
 8 \dots 2324 \\
 4167 \\
 320168 \\
 64700224 \\
 \hline
 2324 \\
 2324 \\
 9296 \\
 4648 \\
 6972 \\
 4648 \\
 \hline
 5400976 \\
 2324 \\
 \hline
 21603904 \\
 10801952 \\
 16202928 \\
 10801952 \\
 \hline
 12551868224
 \end{array}$$

## The Extraction of rootes.

But when you haue a number giuen to extract the cube roote and the aforesaid giuen number bee not a right cube number, whereby you cannot come to any perfect roote thereof, but that there will remaine some fraction or broken number after yout said extraction, onely the manner to extract the neereff roote of a number not cubicall, as most wryters doe affirme, is thus:

The difference betwixt the Cubicke number of the roote and the Cubicke number of a number more then the Roote by an vnty, shall be denominato<sup>r</sup> to the remainer: as for example.

Let 12. be a number giuen, which not being a right Cube number, I would finde the neateff roote therof: first y<sup>e</sup> greatest cubick number in 12. is 8. the cube roote wherof being 2. I put in y<sup>e</sup> quotient & subtracting 8 the cube therof fro 12. there will rest 4. which 4 being ouer, sheweth that 12. is no cubick n<sup>u</sup>ber, therfore I put 4 for the numerato<sup>r</sup>; and to finde the denominato<sup>r</sup> thereto. I let downe the cube of 2 the roote founde, which is 8 and likewise 27. the cube of 3. which is a number more then the roote by one, the subtracting y<sup>e</sup> one fro the other, viz. 8 fro 27. leaues 19. for the Denominato<sup>r</sup>, by which reason the neareff cubicke roote of 12. is 2  $\frac{4}{19}$ , which being reduced & multiplyed cubicly, makes 12.  $\frac{64}{271}$  the same abreviated makes 12. & very neere; & it should bee but 12. therfore the erro<sup>r</sup> is  $\frac{1}{271}$  too much, which although in this is no great erro<sup>r</sup> yet in a greater s<sup>u</sup>me the erro<sup>r</sup> would be very much: Therfore, for those which desire a more exact and perfect extraction of the Square or Cube roote, from numbers not being right square, or Cubick numbers, P. Record in his Whetstone of Wit, setteth down an exact way (but very tedious) which is thus: for y<sup>e</sup> square roote, adde to the giuen number so many times 2 ciphers as you desire the nereffe of the roote: and for the cubicke roote, so many times 3 ciphers as you desire the exactnes of the roote therof, & vnder the said ciphers put prickes in such order as is before taught, & then marke how many prickes there is ouer & besides the prickes of the giuen number, and then extract the Roote from all those ciphers in such order as you did before: for if there bee one more, the roote shalbe tenthes, and the remainer partes of  $\frac{1}{10}$ ; if there bee two points or prickes ouer more then the giuen number, then the

Roote

## The Extraction of rootes.

Roote shalbe hundredeths, & the remainder, partes of  $\frac{1}{100}$  if 3. pykes be ouer, the root shalbe thousands, and the remainder partes of  $\frac{1}{1000}$  and so you may come to a very neare roote but not to any exact or perfect roote vnlesse the giuen number be a right square or cubical number.

A Declaration of the Tables of Lon. & Lat. of places following.

The Tables hereafter following, shewing the Long. & Latitu. of places, viz. of Kingdoms, Prouinces, Cities, Isles, Capes, bayes, Riuers & Mountaines: especially the most principall of them in the whole world, are gathered frō the latest descriptions, maps & charts as wel vniuersal as perticuler: who albeit they differ greatly in Lon. yet in La. most of them agree: & also hauing a respect to the beginning of each of their seuerall Lon. they come all to a neere agreement: for some beginning their Lon. at the westermost part of Africa, make the Lon. of Lond. to be about 10. deg. 20. mi. others beginning at the Canary Islands, make the Lo. of Lond. 18. deg. others more westward, make it 19. de. 30. mi. & Iodocus Hondius beginning the Mer. at the Ile Pico one of the Azores, makes London to be in lon. 27. de. 40. mi. but following P. Emery Molineux, according to his great Globes, doe account the lon. frō y westermost parte of S. Michaels, another Ile of y Azores: the midst of which Ile is 50. mi. in lon. & frō the westermost part therof, the lon. of London is 25. deg. 40. mi. which in effect is not much differēt from any of the others: note that y lon. is counted from the Mer. passing ouer the aforesaid place E. wards in a continuall progression, to the end of 360, which is the whole circumference of the world: lati. is counted from the Equin. to the end of 90 deg. on each side thereof: and where the letter S. is after any number, it shewes the place to haue so many deg. & mi. of S. Lat. all the rest hauing no letter adioyning haue P. la. the whole being set in Alphabetical order, for the readier finding of any place therein contained: & where the longitu. and latit. of any Kingdome is set downe, noted by this syllable reg. it expresseth y middle therof: further, at the end of such places as begin with one letter, is left a space wherein the traoueller may insert such places wherof the longitude and latitude is to him knowne, and not heerein expresse.



# A Table of the Longitude and Latitude of all the notable places of the world.

A	Longi.	Latitu	A	Longi	Latit
<b>A</b> Berden	22 21	57 21	Alguecet	63 41	26 51
Aabo	47 51	61 1	Alicante	28 41	39 1
abragaima	156 1	32 41	Alicoa	76 41	13 21 s
Elabrigo	187 11	3 29 s	Alicur	44 21	38 29
acapulco	276 1	18 1	Alma	108 51	31 1
acartii an lland	329 1	52 1	Alleluia	70 21	10 1
azores an lland	357 1	39 1	Almedina	34 1	33 41
aden	82 1	13 51	Almiria	26 11	37 21
adia	50 11	25 1 s	Alpes a mountaine	41 29	47 29
adu	105 41	5 41 s	Aligubas	147 11	38 41
Egypt	64 1	30 1	Amazen	45 29	12 41
africa reg	40 1	10 1	amazons reg	323 1	13 1
agonara	162 21	38 1	Las amazona	312 29	12 29 s
agragam	144 29	8 21 s	Ammon	59 41	27 11
aguada	173 51	7 51 :	Amsterdam	33 1	51 29
aguada segura	253 29	24 1	Anaft	19 15	33 1
aguada de pcos	245 21	28 1	Anarie a mount	116 1	54 29
alauia a mountaine	98 41	54 21	Ancona	63 11	1 11
alacrane	283 1	22 1	Ancona	43 29	43 51
alagoa	58 41	29 41 s	Andernopoly	58 11	44 41
albion noua	235 1	50 1 s	S.andra	170 29	12 1
albiren	109 29	25 29	S.andre	22 11	56 21
albofera	37 21	8 1	S.andreas	62 11	61 11
alboram	25 29	35 29	Las anegadas	296 0	50 1 s
albrough	27 25	52 29	angier	24 41	47 35
alepo	72 29	38 1	anglesey	19 51	54 0
alcada	23 1	40 29	anglia reg	23 0	53 0
alexandria	65 1	31 21	angolefme	27 1	46 0
alexandria	106 51	36 21	angotereg	67 1	1 6
algazin	16 0	29 1	annbily reg	134 11	63 0
algieri	33 1	35 21	antiochia	72 30	39 0

Antiochia

A	Longit	Latitu	A	Longit	Latitu
Antiochia	300 50	6 40	ayaman reg	82 0 25 0	
Antipara	74 20	25 20 s	azabar	75 30	51 20
Antwerpen	31 20	50 30	azamor	18 30	32 40
Apamia	61 30	43 40	azafy	17 15	32 10
Aqua lega	86 40	9 50 s	azara montaine	59 0	22 40
Ara	14 20	55 10	azzell	62 40	1 30 s
Arabia felix	83 0	21 0	amieas	28 30	49 40
Arabia desert	77 0	20 0	aragon	26 0	42 0
Aracam reg	132 0	25 0			
Ardaguy	136 20	5 10 s			
Aren	76 10	5 10			
Argell	84 30	15 0			
Arglas	16 30	54 20			
Armenia reg	76 0	41 0			
Arnaltus mont	35 0	11 30 s			
Ascension	353 20	18 50			
La Ascension	15 30	8 0 s			
Ascension	290 30	29 30			
Asia reg	130 0	55 0			
Asmery mont	137 0	50 0			
Aspefa	52 15	44 20			
Aspezi mont	100 0	50 40			
asiria reg	85 0	36 0			
Astapus fluui	64 0	4 0			
afuga	66 40	7 20			
atacama	303 30	32 0 s			
atalaya	283 0	20 10			
atalaia	291 0	29 40			
atalaia	27 50	6 20			
ataualo	298 10	13 0 s			
athens	56 10	40 0			
auero	17 30	41 10			
augustin	293 0	29 50			
awignon	32 40	44 40			
aulona	51 20	41 40			
ausburgh	38 40	48 30			

B.

babilon	82 20	33 0
babel mandell	80 0	12 50
bachu	88 50	42 0
bachnapa	72 0	4 0 s
bactriana reg	115 0	38 30
badaios	19 40	38 30
bafar	52 20	21 40 s
bagafus a lake	77 10	50 40
baharaman lle	87 20	27 30
bayes		
bayanegada	319 50	40 20 s
bay de baxos ane-	321 30	39 50 s
gados		
buena baya	190 20	4 40 s
bay de los condos	320 20	43 0
bay a dalagoa	56 10	32 10 s
bay de fumos	240 20	36 0
bay degent grand	303 0	54 0 s
bay hermosa	54 20	32 40 s
bay S. Iohan	309 40	40 30
bay de S. Migell	39 30	8 40 s
bay Ocfinora	312 30	41 0
bay de pinos	233 0	40 30

B	Longi.	Latitu	B	Longi	Latit.
Baylangos	18 0	37 30	Blaskey	12 0	51 40
B. defaluadeges	344 0	20 0	Blaues	31 10	42 0
B de S. Sebastian.	83 20	13 20	Blauet	21 15	47 50
Bacalaio	335 4	48 28	Bloc	5 30	67 0
Bayda reg	126 0	65 0	Borno regnum	48 30	17 10
Bayona	17 20	42 10	borntholme	40 50	55 30
Bayone	25 30	44 0	bouenbergen	34 20	56 30
Balgada	69 30	5 0	brandenberge	42 30	52 50
Balfera	82 40	31 10	brasill	5 10	51 20
Bamberg	39 15	50 10	brasilia regnum	345 0	10 0 S
Barbada	320 50	19 50	braua	74 30	0 30
La Barbada	192 50	1 50 S	breft	20 0	48 50
Barbados	210 10	8 50	breft	331 0	53 0
Barlingas	16 20	39 30	bruage	25 30	45 50
Barnagasso reg.	70 0	13 0	bruges	29 0	51 10
S. Bartholome	194 30	14 0	buda	48 0	47 20
Bafell	37 10	47 50	burdeaux	26 0	45 10
Beciafa	65 0	10 30	bristow	22 50	51 35
Becolicus a mont	56 0	26 30	brachipult point	21 25	53 0
Beil	76 15	27 10	in Wales.		
Belef	69 0	51 40	backapra	31 0	59 50
Belle Ile	334 0	52 20	brussels	30 50	51 0
Belisse	21 40	47 0	barcelona	28 15	41 10
Belt	52 30	50 0	Barlings.	16 0	39 38
Bengala reg.	126 0	26 30	C		
Benichao	136 0	3 50	Capes		
Benin regnum	41 0	7 40	Cape S. Francis	335 0	48 5
Bepirus a mont.	143 0	34 0	Ca. de Espera	335 5	47 0
Bepirus ariuer	138 20	34 0	Cape Raso	334 40	46 28
Berga	40 10	62 50	Cape Massifaco	24 0	43 32
Bergen	30 30	60 50	Cape de Las penes	21 0	43 35
Berwicke	22 50	55 50	Cape de Alinde	346 50	1 0
Bethle	138 50	25 40	Cape del ambar	83 30	2 0 S
Biafar regnum.	50 0	4 0	Cape de S. Antoni	289 15	22 50 S
Bialigrod	58 20	47 30	Cape Cleare	14 10	51 9
Bilbao.	23 30	43 0	Cape de S Antoni	74 30	17 0 S



C	Longi	Lati.	C	Longi	Lati.
Cape de S. Auguſt	162	0 6 30	Cap de Maio	82 51	15 51 s
Cape de S. Auguſt	354	0 8 30 s	cap de S. Maria	327 11	35 11 s
Cape baxo	328	0 4 20	cap de S. Maria	9 41	21 41
Cap de las baxas	19 41	15 29	cap de la mola	36 51	6 29
Cap bedford	320	1 6 5 29	cabode nombre	308 11	53 1
Cap blanco	273	19 25 21	de Ieſus		
Cap blanco	281	19 10 29	cap Ortegall	18 29	44 11
Cap blanco	330	11 1 1 s	cap de Palmas	348 11	1 19 s
Cap blanco	331	21 4 29	cap paſſaro	46 29	36 51
Cap blanco	334	21 52 1	cap rafalgate	96 21	22 21
Cap blanco	9 20	20 29	cap raſo	317 41	8 0
Cap blanco	289 41	2 21 s	cap Roxent	16 29	18 51
Cap blanco	151	1 22 41	cap roxo	11 11	12 0
Cap braua	275	1 27 29	cap of good hope	50 29	35 0 s
Cap de breton	331	1 45 41	cap del ſpirito ſant	161 11	13 11
Cap cameron	287 21	25 41	cap S. Vincent	17 13	37 1
Cap cantin	17	1 32 11	cap Verd	9 51	14 29
Ca. de S. catherina	41	1 1 1 s	cap de bonna viſta	334 21	49 11
Cap de cro	31 29	42 11	cap Walsingham	321	1 63 41
Cap croce	65 21	48 21	camdu reg	136	1 47 0
Cap deſierto	281 21	29 21	cairo	67 29	30 0
Cap de ſperance	324 29	51 1	calamita	67 41	48 10
Ca. de S. domingo	315 21	46 41 s	caldy	20	1 51 40
Cap droſey	13	1 51 11	calecut	112 41	10 29
Cap feare	305 11	32 29	callice in Franc.	29 10	50 40
Cap Felix	84 29	14 11	cales in ſpane	20 51	36 10
Cap finis Terre	16	1 43 11	cambalu	161 11	51 40
Cap Florida	293 21	25 29	cana	68	1 25 40
Cap formoſo	28	1 5 1	canada	305 11	50 21
Cap froward	302 39	53 21 s	canaria	9 29	27 21
cap de gato	26 39	36 51	candia	59 29	35 21
cap de S. helena	326 11	36 11 s	caraiam regnum	136 51	41 0
cap de ſantiago	309	1 37 29	caribanum reg.	310	1 5 0
cap S. Iohn	62 29	67 29	caribes	316 11	7 0
cap de Krin	13	1 53 41	carragena	300	1 11 2
cap de S. Maria	77 29	24 1 s	cartagena	28 21	38 20

C	Longit.	Latitu	C	Longi	Latitu
cartago	299 29	3 11	E. of cumb. Iles	316 0	63 21
casenareg	38 21	17 11	cusilt an reg	87 0	32 0
castrar reg	132 1	47 1	conough	15 35	53 45
cataio reg	150 1	53 1	cambridge	25 50	52 14
catnes	22 9	58 29	D		
catwicke	41 11	69 11	Dageroort	48 41	59 41
ceris	87 51	38 41	Dalacia	77 0	14 21
chesimur reg	115 0	29 0	Damascus	74 29	35 0
chester in Egland	21 29	53 51	Dantzick	46 0	55 0
chichester	24 11	51 0	L. Darcies Ile	327 51	68 21
chidlyes cape	326 41	67 29	Delli reg	114 0	18 29
chily reg	305 0	30 1s	Derwinda	47 51	57 29
chirman reg	96 0	26 29	Deuenter	33 25	51 51
ciartiam reg	136 29	51 1	Diep	28 41	49 29
cinna	67 1	41 21	Dires cape	321 29	64 51
cirena	53 29	32 0	Dominica	319 41	14 0
ciprus	68 40	37 30	Dona riuer	75 0	53 21
clearmont	30 55	45 51	Donecz a riuer	71 0	51 0
cocas a mountai	79 0	47 29	Dorow	58 0	51 29
cochin	114 0	9 14	Douer	28 11	51
collao reg	310 0	16 0s	Drongenes	4 29	66 29
colmogory	62 41	63 41	Drin	50 0	45 0
colne	34 0	51 41	Dubdu	25 0	32 51
commania reg	86 0	51 0	Dubino	35 21	54 0
congu	147 21	49 11	Dublin	16 41	53 11
coninxberg	49 11	55 29	Dumaran	150 0	8 41
constantinople	61 20	44 40	Duy	34 29	59 21
coppen hage	38 29	55 51	Duyhe	56 29	50 29
corafau reg	108 1	37 0	Dams straights	324 1	64 0
corck in Ireland	15 41	51 41	Darby	24 5	52 55
corfu an lland	22 0	39 29	Dunkerck	29 10	51 12
corinth	54 21	39 0			
corfica	38 11	42 0	E		
cotum reg	130 0	51 0	Ebaida	60 1	25 29
cracow	48 29	50 0	Ecfonen	30 15	58 11
cuba	296 0	31 41	Edenbrough	22 1	55 51

Elgent

E	Longit	Latitu	F	Longit	Latitu
Elgent	80	c 17 20	Florence	41 10	43 40
Ely	25 20	52 40	Flores Iland	35 34	39 20
Eliobon	72	0 27 0	Florida reg	29 2	0 31 0
Elior	26 20	10 10	Focen	38 40	46 30
Qu. Elizabe. for	337	c 61 30	Laformanos	31 03	60 40
land			Formentera	31 10	38 50
Emden	34 10	53 10	Forteuentura	11	0 28 0
Ens	43	0 48 30	Foyl	15 50	55 30
Ens	74 10	37 30	Frayles	31 43	0 11 20
Ephesus	60 30	39 40	Franckfort	36 30	50 0
Ergas	86	0 38 0	Frisland	35 13	0 62 0
Ergimul	45	0 59 0	Frobishers flay	33 12	0 64 0
Euboya	56 10	41 0	a furious ouer fall	32 23	0 60 0
Euphrates	76 46	40 0	Farre Ilands	20	0 62 10
Europareg	55	0 51 0	Fathill Ile	24 45	60 0
Exeter	22 10	50 0			
Enchuisen	21 40	52 54			
F			G		
Falckzin	57 20	47 0	Gago regnum	25	0 8 30
Falsterhode	40	0 56 0	Galathia	37 20	37 0
Famagossa	69 20	57 30	Gambra a riuier	12	0 13 10
Farallones	294 20	11 40 s	Gane	30 20	50 40
Fargana	114 40	46 c	garamantica	51 30	16 0
Farre	16 20	61 30	garnsey	22 20	49 40
Cape Fattache	86 50	15 40	gaza	70 50	33 10
Fato	75 50	45 40	gemanacota	118 40	6 0
Farnasa	38 10	30 10	geneua	33 40	46 20
Fayall	356	c 38 40	Oenua	37 50	45 0
Fernandobucke	351 40	9 20 s	genua	15 20	16 0
Fees reg	21 50	32 50	gerguth reg	153	0 57 0
Fierro	6 20	26 30	germanareo	42	0 51 0
Finmarke	47	0 69 30	gerseluin	24 30	32 20
Flambrough head	20	54 0	gestreg	106 30	26 0
Flensburgh	36 40	53 0	ghir a riuier	25 30	22 0
Fleccory	32	0 58 0	ghir a desert	24	0 22 0
Flye	32	0 53 33			

Giamber



G	Longi.	Latit.	H	Longi.	Lati.
Giamber	18 1	33 41	Haleslland	337 51	63 0
Gilan	94 1	39 21	Haliber	78 41	20 11
Gilberts found	326 51	67 1	Hallicz	52 51	48 41
Giras a riuer	41 21	20 11	Hambrough	37 11	53 21
Galloway	15 49	53 15	Hartlepole.	24 0	55 21
goa	112 21	14 41	Harwich	27 29	52 0
Godia	22 30	18 11	Hauana	292 11	20 0
Glosgow	29 0	57 0	Hebrides	15 20	58 0
Golfo de bēngal	125 0	15 0	Heydelberg	36 0	49 0
Golfo de S. Helen.	48 41	33 29 S	Heist	23 29	46 29
Golfo de la India	44 21	3 41 S	Heishant	19 29	48 41
Golf delos negi.	350 30	2 0 S	Heptapolis	324 29	25 21
Golfo del Rey	40 41	5 30	Hercules pillers	69 21	32 11
Golfo de todos santos	345 30	1 41 S	Helichland	33 51	66 0
Gorage reg	69 0	2 0	Hercania reg	100 0	40 0
Goram	58 15	28 30	Hispanio reg	25 0	40 0
Goteland	45 21	57 30	Noua Hispania	280 0	13 29
Gozo	58 20	34 41	Hispaniola	306 0	18 29
Granda	318 20	11 0	Holindall	36 11	61 1
Granta	23 30	38 0	Homey	61 30	52 51
Grecia reg	54 0	40 0	Hontsoort	48 30	59 1
Gratiofa	357 30	39 29	Hull	25 21	53 41
Grooninghen	32 11	53 0	hungaria	50 0	48 1
Groenland	0 0	75 0	hipaspes a riuer	124 0	33 21
Groy	21 0	47 21	hipafis a riuer	124 0	33 1
Guber reg	27 0	9 0	helinhead	15 2	55 15
Guangera reg	44 0	13 41	hereford	22 38	52 12
Gudan	48 21	8 51	heel of danthick	46 10	55 40
Guinea noua	180 0	5 0 S	I		
Guinea reg	18 0	9 0	Iacuby a riuer	64 1	48 1
Galye	33 30	50 41	Iadye	58 21	11 41
Gunagona	67 30	6 0	Iamaica	238 29	17 1
Gustina	109 30	56 11	Iambut	72 29	26 29
giberalter straig	21 30	35 29	Iarchem reg	117 29	44 1
			Iapones	169 0	36 1

I	Longi.	Lati.	I	Longi.	Lati.
Iarley Iland	23	0 49 20	Ile de los ladros	177 21	15 1
Iaua maior	140	0 9 0 S	nes		
Iaua minor	150	0 9 0 S	Ile de Lobos	307 41	10 21 S
Iazin	77 30	20 30	Ile de S. maria	296 29	17 21 S
Ietico	73	1 33 10	Ile de martin	10 41	21 41
Ierusalem	72 21	33 0	vaz		
Iimens a riuier	105	0 27 0	Ile de may	4 29	13 29
Imausa moun-	128	0 39 0	Ile S. michael	0 0	39 29
taine			Ile de negros	155 29	10 29
India orientall	135	0 26 0	Iland of foules	334	0 50 0
Indus a riuier	115 29	26 0	Ile de Orliance	312	0 50 29
Inspurg	40 41	47 50	Ile de paiaros.	314	0 12 41
Ilands			Ile de palmas	163 21	6 0
The three I-	169 21	2 0 S	Ile de paxaros	198 51	8 51
lands			Ile de paxaros	234 21	28 0
Ile de don Al-	202	8 8 0	Ile of pearles	293 11	7 0
phonso, de Alua-			Ile de pinos	292 21	21 29
res			Ile de rees	162	0 25 21
Ile de aues	310 30	11 20	Ile of Salt	4 11	16 29
Ile de aues	173 50	4 30	Salomons Iland	204	0 10 0
Ile de bastinado	293 30	10 30	Ile of the Sunne	347 41	10 29
Ile braua	1	20 14 20	Ile S. Thomas	38	0 0 0
Ilas de corales	194 40	9 50	Ile S. Thomas	252	0 20 11
Ile de deserto	178	0 31 1	Ile de verde	353 51	45 29 S
Ile del fugoe	2 29	14 21	Ile de S. vincent.	175 50	8 0
Ile del fugoe	181 29	27 41	Ile de S. Vincent	73 21	20 29
Ile de los galo-	281 10	4 0	Ioam	135	0 7 29
pegos maiores			Ioloforeg	24 29	6 0
Ile de los galop.	277 30	1 10	Ipswitch	27 12	52 22
minor			Ioppe	71 21	34 0
Ile de bombres	169 20	5 41 S	Isabella	305 21	18 51
blanc			Island	8	0 66 0
Ile de Salago.	158 20	8 1 S	Italy reg	42 29	43
Ile S. Iohn	325 29	42 30	Ireland	16	0 53 29

Lucaten

K	Longi.	Latit.	H	Longi.	Latit.
Acatan reg	283	0 18 0	Ladoga	62 11	61 40
Agor	138	0 7 50	Lago de los coros	295	1 44 05
Auca	31 21	39 30	nade		
Alibella	61	0 1 30	Laja	45 29	64 10
			Lampesa	36 21	33 05
			Lancerrota	11 41	29 30
			Lanow	51 11	52 20
			Laredo	22 51	43 0
			Larissa	70	0 33 0
			Larta	53	0 46 0
K			Leeknes	23 29	58 0
Kalmuchy in	95	0 51 0	Leon	21 11	42 15
Tartaria.			Leon	283 41	11 21
Kaniow	63 40	51 10	Leopolis	52 51	49 2
Karakithath	119	0 51 0	Lepin	98	0 58 41
reg			Leguio Mas	165	0 28 0
Karatzeff	67 20	53 0	ior		
Kargapole	66 30	61 50	Leguio Mis	158 41	22 0
Kafakky tartas	103	0 51 0	nor		
ria			Lerida	28 21	41 30
Kiow	62 20	51 10	Lesterpoint	385	0 62 0
Kithais reg	110	0 57 0	Lima	296 41	23 36 51
Kithay a Lake	123 31	53 0	Limonia	72 11	44 20
Kola	54 51	69 0	Limofa	43 29	34 50
Koleuig	4 11	65 10	Lyons	32 41	45 40
Kofar a river	96 40	49 0	Lyorne	40 21	43 30
Kintaile	19 39	56 45	Lisboa	17 29	39 11
Kinfaile	15	3 51 35	Lyzard	18 30	50 10
			London	25 50	51 40
			London coast.	326 21	72 0
			Lepeso	74	1 49 41
			Loyre a Riuer.	24 41	47 41
			Long Sound	34 30	58 55
L					
Lacierna	24 50	39 30			
Ladena	53 30	41 31			

Lubeck



L	Longi.	Latitu	m	Longi.	Latitu
Lubeck	38 29	53 51	malaga	23 51	37 21
Lucka	42 11	52 0	maldauaran Iland.	113 0	3 0
Luky	64 0	58 21	malorca	39 51	32 51
L. Lumleis Inlet.	320 0	61 0	maltailand	46 0	35 31
Luna a Moun- taine	60 0	16 0	man aniland	19 0	54 51
Lundy	19 29	51 0	mauatengareg	77 0	22 21 <sup>s</sup>
Lutzko	54 0	50 21	mandao reg	121 0	25 0
Lufon an Iland.	156 0	17 0	mangesia	61 29	41 29
Lybia	33 0	23 30	mangior china	150 0	37 0
Lin	26 25	52 48	manica	62 51	23 29 <sup>s</sup>
Lincolne.	25 25	53 22	manicongo reg	46 41	5 0 <sup>s</sup>
			maniola iland	140 30	2 0
			marchant ile	327 0	68 21
			mare debachuor the caspium sea.	92 0	45 0
			mare congelatum	345 0	64 0
			mare de india	120 0	10 0
			mare maior	68 0	46 0
			mare medetereni- um	50 0	35 0
M			mare rubrum the red sea	75 0	20 0
Maboga	64 41	13 30 <sup>s</sup>	mare vermeyo	255 0	26 0
machian	160 41	0 29	mare del zur	270 0	10 0
machocenta	39 51	33 51	margarita	314 11	10 50
macsin Ilands	93 30	75 30	marigalante	320 0	14 50
macyra an Iland	62 0	19 40	marnios	306 21	40 40
Lamadalena	44 41	7 0	marrocco	20 0	30 29
madera Ilands	8 11	31 29	marcellis	33 51	43 40
meatis palus	71 30	40 29	mafalio	23 29	30 20
magadaxo	78 0	5 11	milford hauen	20 5	51 48
magalo	71 20	9 29 <sup>s</sup>	massagan	30 21	35 20
majda	2 40	46 29	mazakar	169 0	33 0
magallanes	305 0	53 25	meander a moun- taine	152 0	31 30
streiglus			malestream	36 0	67 22
majorca Iland	39 51	33 0			
malibargo	178 51	26 0			
malacaregnum	136 30	2 51			

M.	Longi.	Latitu	N	Longi	Latit.
Aeb.	46 29	54 40	mosla	84 30	35 0
Medina cely	23 29	41 10	mosull	84 0	34 50
Medina talnaby	73 0	27 20	mozera	24 20	34 30
Medino	98 29	36 29	moscenek	69 50	51 30
Midleburgh	29 40	52 0	munster.	35 0	52 10
Meiffen	41 0	51 10			
Malindereg	71 21	3 20 s	N		
nelley reg.	15 41	12 0	Nabarz	79 50	50 30
Meluing	48 1	54 50	Naygay in Tartar	97 0	53 30
Mems	35 51	50 0	Naym	94 10	33 40
Mesbet	85 29	52 50	Nayman reg	140 0	64 0
Mesopotamia	78 1	35 0	Naynen	31 10	50 0
Messara	45 51	37 50	Nantes	24 10	47 50
Metz	33 29	49 45	Napoly	45 0	41 0
Mien reg.	136 1	31 0	Napoly	55 10	38 0
Miens. kow	56 41	54 50	Napthaly	73 0	34 30
Millan	38 29	46 10	Narbona	30 20	43 20
Minor ca lle	34 29	40 0	Nardenborg	47 10	67 50
modon	53 21	37 0	Narue	56 10	60 0
Moguer	20 0	37 50	Naruare	21 55	42 39
Moldavia reg	55 0	45 0	Naseph	110 30	43 0
molines	30 21	47 40	Natolia reg	66 0	41 0
molucca llands	160 41	1 c	Nazareth	72 40	34 10
memorancie	136 0	47 0	Nerpis	45 30	62 50
momphelier	31 29	44 10	Neurex	57 0	64 20
mongull reg	160 0	61 30	Newcastle.	23 10	55 20
Monte de brand.	47 11	30 15 s	Nicaree.	59 30	39 30
Mont fragoso	344 0	12 0	Nicobar an lland,	130 30	10 40
Mont negro	44 41	17 0	Nicemedia	63 30	44 20
Mont raleigh	320 20	65 0	Nicopolis	56 30	45 0
Mont royall	301 0	45 40	Nicflot	57 40	59 50
Morea reg	54 30	38 0	Nilus a riuer,	67 20	32 10
Mosaik	68 50	55 0	Ninus	82 20	37 10
mosambique reg.	70 20	14 40	Nisa	36 10	44 0
Moscouia reg	80 0	59 0	Nissa	45 30	50 50
moskow	70 30	35 10	Naze in Norway	31 0	58 5

Neos







R	Longi.	Latitu	S	i	Longi	Latit.
Rio de camaron	315	0 44 29 s	Sabarza		154 51	45 0
Rio del campo	42	29 2 51	Sablestan reg		114 0	34 0
Rio de cano	298	41 33 11	Sabron		84 51	45 11
Rio dangla	42	29 0 41	Saendebar		174 41	35 51
Rio dulce	316	29 52 0	sagatin		95 29	58 21
Rio de s. domingo	353	0 7 51	sala		49 41	48 0
Rio del estremo	340	41 22 59 s	salamanca		20 29	40 51
Rio de Flores	287	19 29 0 s	salasta		72 41	41 51
Rio del gado	34	21 6 21	salabrema		24 51	37 29
Rio de gigantes	278	29 29 0	salina		45 0	38 29
Rio grande	301	11 11 0	salsburg		42 0	48 21
Rio grande	314	29 44 0	salstom		32 21	62 0
Rio del guato	284	29 29 29	saluado		321 21	5 0
Rio de la hacha	304	15 10 41	samarchant		109 0	44 0
Rio de s. Helena	348	41 10 29 s	samaria		72 21	47 41
S. Lawrens riuer	318	51 53 0	sanderfons Tow		320 0	55 29
Rio de manicong	48	21 10 0 s	Hope sanderfons		326 21	72 41
Rio del oro	10	21 22 29	sandry		162 51	53 0
Rio de palmas	272	11 14 21	sanfon		20 41	43 21
Rio panuco	271	51 22 29	S. Cruce		334 21	43 29
Rio de perla	292	29 29 0	s. Davids		20 0	52 0
Rio de la plata	326	29 36 0	s. Domingo		307 11	17 51
Rio primero	327	41 45 0	s. George		357 11	39 0
Rio santo	300	29 3 0 s	s. Helena		24 29	16 0 s
Rio de spirito san.	281	29 31 0	santiago		264 29	20 29
The white Riuer	308	11 51 21 s	santiago		298 11	32 11
Rypon	35	29 55 21	s. Iago		175 29	2 0
Roan	27	41 48 51	s. Iohn de luz		25 11	43 21
Rochell	25	29 46 41	s. Lazaro		71 0	11 21 s
Romey	42	29 42 0	s. Lucar		21 21	7 11
Rooswick	40	21 54 0	s. Lutia		0 1	17 0
Rostone	72	11 57 0	s. Malo		24 21	48 51
Russia	57	29 59 29	s. maria		82 29	17 0 s
Rye	27	29 51 1	s. maria		240 41	34 21
			s. maria		0 19	56 0
			s. maries		85 1	44 29

S	Longi.	Latitu	S	Longi	Latit
S. Maries of Na.	66 30	16 29	Skalholt	8 30	65 20
S. Martha	301 21	10 41	Sibier reg	99 20	59 30
S. Martin	321 11	51 0	Sicilia	45 0	37 30
S. Martins Iland	293 40	46 51 s	fidon	72 10	36 30
S. mathewes	21 11	1 51 s	figistan reg	105 0	31 0
S. michel	60 50	65 29	finiso	69 10	44 21
S. michaell	0 50	38 5	fina	70 0	41 41
S. miguell	327 21	47 21	fina mountaine	75 0	30 0
S. miguell	291 41	6 11 s	finus mexico	280 0	26 0
S. miguell	268 0	24 0	finus persia	85 0	29 0
S. miguell	249 0	32 51	fion	59 10	12 40
S. Nicolas	69 0	54 0	lipanto	45 30	41 50
S. Nicolas	323 21	53 41	fiuill	18 6	37 45
S. Nicolas	2 2	17 0	flaba	55 50	58 41
S. Petro	64 29	0 29	flaunia	47 0	45 0
S. Pol de Lyon	20 41	48 48	flego in Ireland	15 35	54 15
S. Sampson	306 29	40 29	flowoda	68 20	64 30
S. Vincent	0 29	17 29	flowoda	86 30	58 51
s. Vincent	318 41	11 51	flutzk	59 0	52 58
Sapom Iland	107 11	0 29	fmirna	60 21	40 29
Sarachy	84 29	44 11	fnauell	2 30	64 21
Saragofa	26 11	41 51	folangi reg	139 0	50 0
Sardinia	39 0	40 0	solosky	55 0	64 29
Satyres Iland	174 11	46 30	forlings	18 0	50 0
Sauatapoly	75 29	47 21	spakado	46 50	45 21
Scarbrough	24 51	54 51	spier	35 30	49 21
Schotland	25 0	60 0	spina	60 50	43 29
Scotland	20 0	57 0	stad	30 40	61 41
Segedin	49 0	47 11	stapholt	2 20	65 41
Seames	19 29	48 21	stetin	42 10	53 51
Senega reg	13 0	24 0	stoby	52 30	44 0
Sernery reg	106 29	33 29	stocholme	42 0	58 11
Shaboglifhar	83 41	56 29	straights of matu-	74 30	73 11
Shahas kik	91 29	53 0	chin		
Shrewesbury	22 35	52 55	seuedia reg	40 0	60 0
Shensk	68 40	61 51	sumatra an Iland	134 0	0 0

Suly



F	Longit	Latitu	T	Longit	Latitu
Silly	18	05 10	Texel in Holland	31	05 15
Stert	22 50	50 40	Theffet reg	20	029 10
Swelt	64 51	52 11	Thebet reg	138	50 44 0
Swineburne head	25	059 51	Tholomon	144	20 40 0
Siria	74	039 0	Tholoufe	28	40 43 50
Siracufa	45 41	37 0	Thunnis	67	40 32 0
Southampton	24	551 11	Tigris a riuier	84	034 30
T			Tocros	54	50 46 0
Tabaco	322	11 10 41	Togora	146	049 50
Tacan	152	21 48 51	Tolledo	22	20 39 40
Tagaranto	143	29 2 21	Tollon	34	543 20
Taguina an Iland	154	29 5 21	Toul	33	10 49 10
Taiona	59	29 53 29	Toures	27	30 47 50
Talabora	312	026 21 s	Trebifonde	74	30 44 40
Talcan	85	047 0	Trent	40	10 46 10
Tamafa	75	29 46 0	Triago an Iland	278	40 21 0
Taranto	48	040 29	Tribanta	63	30 41 50
Tarapaca	306	21 30 41 s	Trin	36	30 45 40
Tarbacan	109	29 34 51	Trinidad	355	20 19 10 s
Targa reg	32	025 0	Trinidad	295	50 21 20
Tarragona	29	29 40 41	Trinidad	319	20 9 0
Tarso	71	21 40 0	Trinty harbor	308	30 36 0
Tartar	152	063 21	Tripolis antiqua	44	21 30 20
Tartaria reg	130	062 0	Tripolis in barb.	45	21 30 30
Taskent reg	129	049 0	Tripolis foria	72	21 37 0
Tatracan	55	044 51	Troia	59	042 30
Tellin	13	29 54 41	Troy	31	048 10
Tenariffe	8	11 27 29	Tuia	82	51 52 0
Tenduc reg	170	059 0	Tulla	72	053 20
Tenesab	46	51 61 11	Tuna	41	51 64 30
Tercera	358	23 39 0	Tunis reg	40	036 0
Terra alta	160	29 6 41 s	Turchy reg	110	047 0
Terra alta	45	21 15 21	Turfon	131	30 56 30
Ter de los fumos	322	29 40 21 s	Tyrus	71	35 35 30
Tharfis	115	21 49 0	Tzeroas	79	50 49 20
Theffalonia	53	41 44 21			

V	Longi	Lati.	W	Longi.	Lat <sup>is</sup>
Vaiguy	150 50	39 0	Waersberghen	39 1	57 30
Valentia	29 20	19 41	Wardhous	50 30	70 29
Varcano	107 50	39 0	E. Warwicksfor	323 11	62 11
Varon	83 30	70 30	land		
Vaygats an Iland	81 30	59 21	Waterford	17 15	52 16
Venice	41 40	45 51	Count. Warwick	330 41	64 41
Veroifo	59 50	45 0	found!		
Verdun	32 10	49 20	Walkefield	23 48	53 45
Verma reg	133 0	21 30	Wassilgorod	81 50	56 41
Varona	40 40	45 50	Waxon	49 20	52 29
Viana	17 30	42 0	Weymouth	23 50	51 0
Viatca	87 50	59 30	Welichy	96 30	56 0
Vich	81 40	53 50	Welikipoyassa	101 20	63 29
Vienna	45 30	48 30	Weliky tumen	95 40	56 21
Villac	48 0	46 50	Welisz	63 40	56 51
Villa longa	28 20	7 40	Weroy	36 50	68 41
Ville conde	17 30	41 30	Wesel	31 29	51 29
Villna	54 30	55 0	Westerhol	40 29	67 41
Virginia	302 10	36 0	Whitbay	24 29	55 0
Vissigrod	61 30	51 30	Wiborogh	56 29	62 35
Bona Vista	4 30	15 30	Wightlle	25 11	50 29
Buena vista	308 40	40 11	S. Hugh Willobies	55 0	75 0
Buena vista	177 30	13 30	Iland		
Vkill	53 10	57 0	Winterton	27 20	53 29
Vlm	37 50	48 50	Wologda	73 50	59 29
Volga a riuier	75 40	58 0	Wologda	74 30	60 0
Vpfalia	42 50	60 0	Wollok	68 31	55 50
Vreamca	23 50	46 0			
Vrgis a riuier	85 50	53 20			
Vsting	79 30	61 30			
Vstusna	67 0	59 20			
Vtuall	42 40	62 50			
			X		
			Xaiel	85 30	15 41
			Xandu	168 40	55 41
			Xancs	311 30	11 1
			Xaques	282 0	20 29
			Xara	130 0	17 1

Xibuar

X	Longi.	Latit.	Z	Longi.	Latit.
Xibuar	116	0 45 30	Zama	74 41	11 41
Xiuxa	301	30 12 0 s	Zanhaga reg	20	0 24 0
Xumete	304	20 23 0	Zanziber	73	52 6 29 s
			Zaphalomia	52	0 38 29
			Zara	46	25 45 41
Y			Zaradrusa riuer	126	0 94 0
Yarmouth	27	30 53 0	Zauan	41	29 51 0
Yorke	23	30 54 29	Zebeng	138	41 35 41
Yuagua	303	30 21 0	Zebil a mountaine	47	0 17 0 s
Yuch cope	22	50 56 26	Zedica	48	0 29 29
			Zegzeg reg	36	41 14 41
Z			Noua Zembla	83	29 74 0
Zacabadera	140	40 13 11	Zerigo	56	0 36 0
Zacana a riuer	60	40 13 0 s	Zigeck	45	51 40 51
Zacatula	269	40 20 0	Zimbaos	59	0 25 21 s
zacoton an Iland	88	0 12 51	Zingis	76	11 49 29
Zagatay	105	0 45 0	Zodiala	57	51 4 0 s
Zahafpa	101	20 42 29	Zoidalanel	137	31 3 51 s
Zalines	51	0 58 29	Zuenziga reg	25	0 25 0
Zama	49	30 14 0 s	Zuiatzko	85	21 56 0
			Zunbal	39	31 37 30

## FINIS

## ERRATA.

**P** Age 10 line 5 for 23 degrees 28 minutes read 23 30

Page 14 line 18 and 19 for  $\frac{1}{2}$  read  $\frac{1}{3}$

Page 15 line 33 for  $\frac{1}{2}$  read  $\frac{1}{3}$

In the first page of the Calender for prime 23 read 13

After the Calender.

Leaf E page 13 line 28 *give* must be at the end of the next line

Leaf G. page 15 in the Tables of miles, answerable to a deg. of Long. 77 degrees of Latitude, is left out, and 89 twice in.

Leaf H. page 13 line 9 for Equinoctial point the distance, read Equinoctial point of Libra subtract the distance.

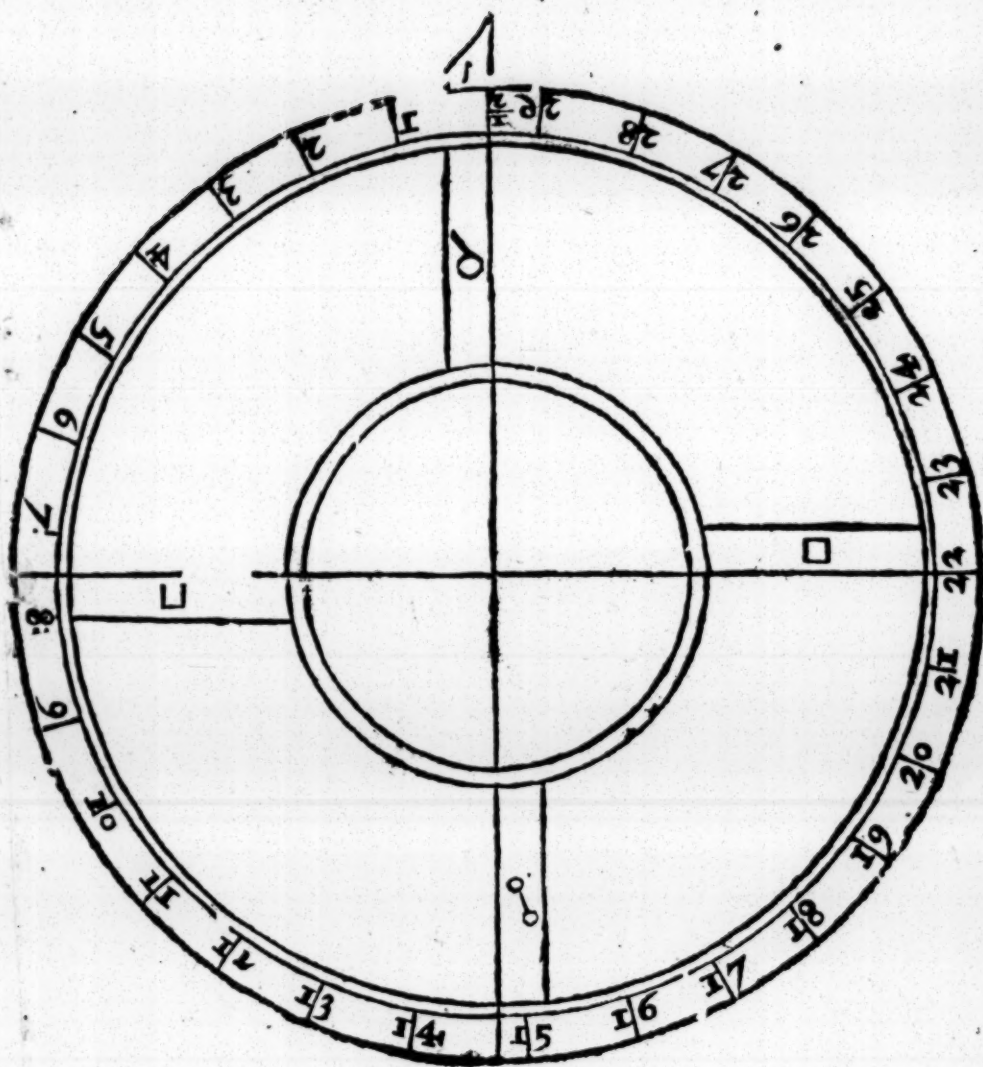
In the Extraction of Roots.

Page 6 line 30 for 1846. read 1856.

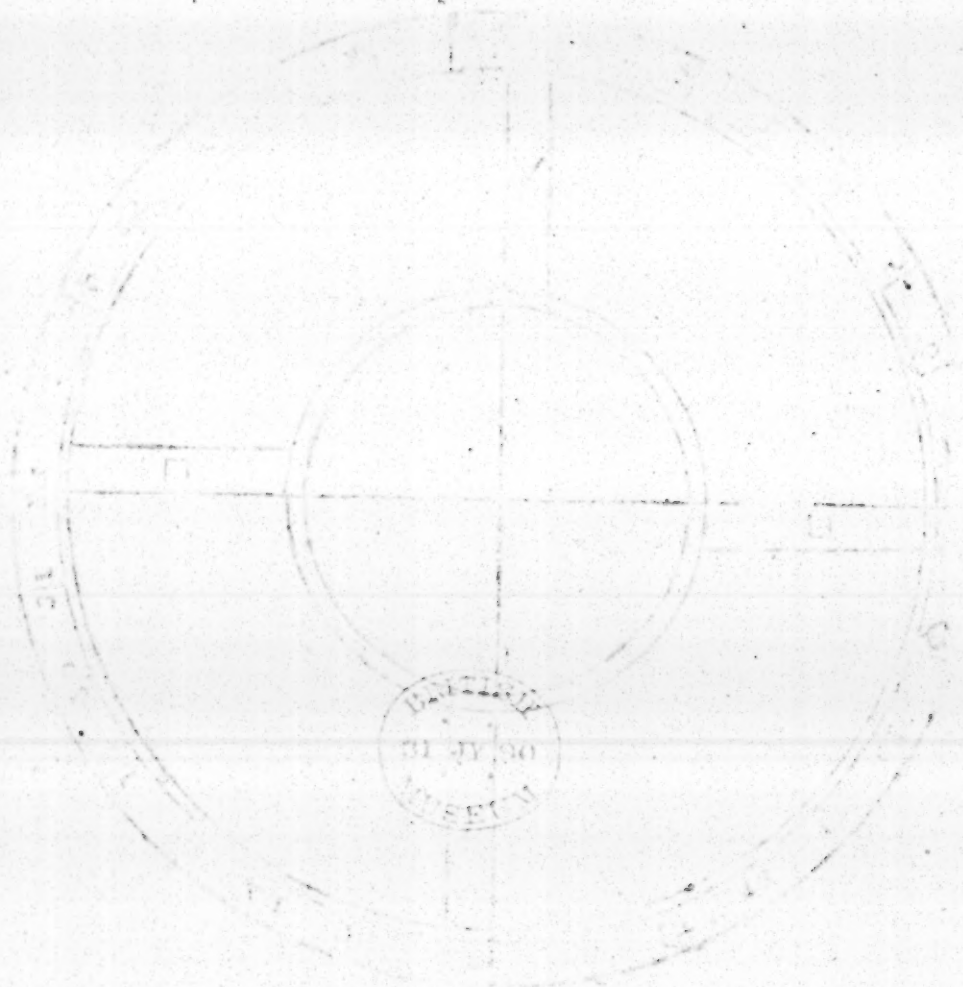
Page 6 line 36 for 2345. read 234.







Handwritten text at the top of the page, possibly a title or header, including the word "MUSEUM" and some numbers.



Handwritten text or a stamp located within the circular diagram, possibly indicating a date or a specific measurement.







